Rethinking Teacher Professionalization Strategies for Sustainable Development in Cameroon

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Abstract

Aim: This study aims to examine the gaps in current teacher professionalization in Cameroon and explore how the principles of Education for Sustainable Development (ESD) can inform innovative strategies to strengthen teacher capacity and improve student learning outcomes. It further seeks to identify effective pathways for enhancing competencies needed for 21st-century teaching within the context of a knowledge-driven society.

Methods: A mixed-methods research design was employed, combining both quantitative and qualitative approaches. Data were collected from 300 teachers, 17 inspectors, and 14 educational administrators. Instruments included a structured questionnaire for teachers, a semi-structured interview guide for administrators, and a focus group guide for inspectors. Quantitative and qualitative data were analyzed to assess existing practices, professionalization gaps, and opportunities for integrating ESD-aligned innovations.

Results: Results reveal substantial disparities between current teacher practices and the competencies required for effective implementation of ESD and modern pedagogical expectations. These gaps highlight the inadequacy of traditional professional development models in responding to the complex demands of contemporary education. Overall, the findings emphasize the need for transformative professionalization strategies that align with sustainability principles and support improved teaching and learning outcomes.

Conclusion: The study concludes that innovative, ESD-guided approaches are essential for strengthening teacher capacity, empowering learners, and advancing a more sustainable and equitable society in Cameroon. Reimagining teacher training through sustainability-oriented frameworks is key to overcoming existing professionalization challenges.

Recommendation: The study recommends the adoption of contextualized, technology-integrated, and sustainability-focused professional development programs. These approaches are essential for bridging current professional gaps, enhancing student learning outcomes, and contributing meaningfully to Cameroon's broader sustainable national development goals.

Keywords: *Teacher professionalization, sustainable development, Education for Sustainable Development (ESD), 21st-Century Learning, Sustainable Development Goals (SDGs)*

INTRODUCTION

In an era where the United Nations 2030 Agenda for Sustainable Development prioritizes sustainability, the role of education in fostering inclusive and lasting development has become more critical than ever. Education for Sustainable Development (ESD), as defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020), empowers learners to make informed decisions and take responsible actions for environmental integrity, economic viability, and social equity, both now and in the future. Teachers, as the frontline implementers of curricula, are essential agents in driving this transformation. However, in Cameroon and much of the Global South, teacher professionalization strategies remain largely rooted in outdated colonial legacies and content-driven models that are disconnected from the realities of modern societies and the imperatives of 21st-century education (Tchombe, 2021; Ngolowu & Asare, 2023).

This disconnect is pedagogical and socio-economic. As highlighted by the Global Institute for Transformative Education (GITE), current educational frameworks in the Global South are inadequate in equipping learners with the competencies to thrive in interconnected, competitive global economies (GITE, 2025). The traditional emphasis on rote learning and standardized teaching undermines the development of critical thinking, innovation, and sustainability consciousness that are vital for addressing local and global challenges (Thankachan, 2024). Research increasingly supports the need for teacher professional development to move away from one-size-fits-all training models and toward transformative, context-responsive approaches that promote professional agency, socio-political awareness, and sustainability thinking, according to the Organisation for Economic Co-operation and Development (OECD, 2021; Sillah & Mofor, 2022).

Teaching is increasingly recognized around the world as the backbone of quality education, and countries are investing heavily in making it a truly professional career. Finland stands out with its requirement that teachers complete masters education level, research-driven training, which equips them to be reflective practitioners who can adapt and innovate in the classroom (Sahlberg, 2011). In the United States, reforms are underway to strengthen teacher preparation by focusing more on clinical practice and aligning training with modern curriculum demands (Darling-Hammond, 2017). Across many systems, professional development is shifting away from one-off workshops toward collaborative, school-embedded learning communities that support teachers throughout their careers (OECD, 2019). Singapore offers another example, where structured career pathways allow teachers to progress into specialist or leadership roles, helping to retain talent and elevate the profession's status (Ng, 2019). At the same time, digital competence and ethical technology use are becoming essential parts of professional standards, as emphasized in the European Commission's Digital Education Action Plan (European Commission, 2020). Taken together, these trends show a global recognition that teaching is not just a job but a dynamic, knowledge-intensive profession that requires sustained investment and support.

In Cameroon, the urgency to restructure the education system is heightened by persistent challenges, including fragmented training programs, inadequate resources (Lack of adequate Infrastructure, Teaching & Learning Materials, Human Resources, Financial Resources and Digital Resources), and limited integration of digital technologies and indigenous knowledge systems (Tambo, 2020; Beyoh, 2024). These gaps hinder the development of a teaching workforce capable of leading change and advancing sustainable social and economic development. Many

teacher education institutions continue to operate under outdated curricula that do not reflect the competencies required for transformative education. Furthermore, professional development opportunities are often irregular, poorly funded, and disconnected from classroom realities, leaving educators ill-equipped to respond to dynamic educational and societal needs (Fombo, 2024). Without a deliberate and systemic overhaul of teacher professionalization, Cameroon risks perpetuating cycles of educational inequity, limited innovation, and stalled national progress.

Therefore, this study sought to rethink teacher professionalization through the lens of transformative education and ESD, proposing innovative pathways that strengthen teacher competencies, improve learner outcomes, and contribute meaningfully to national and regional development. Utilizing a mixed-methods design involving 300 teachers and 30 educational administrators across Cameroon, the research aims to identify critical gaps in existing models and offer contextually grounded, sustainable solutions. Ultimately, this study aligns with the vision of the 2025 World Conference on Transformative Education, contributing to global conversations on how education can serve as a powerful lever for reimagining curriculum, pedagogy, leadership, and policy in ways that foster social equity, economic progress, and long-term resilience in the Global South.

Statement of the Problem

In Cameroon, teacher professionalization remains rooted in traditional, content-driven approaches that fail to meet the evolving demands of 21st-century education and the principles of Education for Sustainable Development (ESD) (Focho, 2023; Fombo, 2024). Despite national and global recognition of teachers as pivotal to achieving Sustainable Development Goal 4 (SDG 4) (UNESCO, 2017; United Nations, 2015), many educators are inadequately equipped with the pedagogical, digital, and critical thinking skills needed to address contemporary challenges such as climate change, inequality, and technological advancement (Souley & Abubaka, 2024; OECD, 2019). Existing teacher training and professional development programs are often rigid, fragmented, and disconnected from real-world classroom realities, limiting their effectiveness in fostering transformative teaching and sustainable learning outcomes (Focho, 2023; UNESCO & Education International, 2021). Although policy frameworks in Cameroon acknowledge the need for teacher reform, implementation remains weak due to systemic issues such as insufficient funding, lack of ongoing professional development structures, and limited stakeholder involvement. This gap between policy and practice contributes to an underprepared teaching workforce and hinders education's potential to drive sustainable national development. There is an urgent need to rethink professionalization strategies by integrating ESD principles, promoting innovation, and contextualizing teacher training to better align with local needs and global educational priorities. This study responds to that need by exploring gaps, opportunities, and innovative pathways for enhancing teacher effectiveness in Cameroon.

Objectives of the Study

1. To examine the existing gaps in current teacher professionalization approaches in Cameroon.

2. To explore how the principles of Education for Sustainable Development (ESD) can inform and enhance teacher professionalization strategies.

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3. To identify and propose innovative professionalization pathways that can improve teacher capacity and enhance student learning outcomes.

Research Questions

1. What are the gaps in current teacher professionalization approaches in Cameroon?
2. How can ESD principles inform teacher professionalization strategies?
3. What innovative professionalization pathways can enhance teacher capacity and student learning outcomes?

LITERATURE REVIEW

The critical role of education in achieving sustainable development has been globally acknowledged, particularly through the Sustainable Development Goals (SDGs), with SDG 4 emphasizing inclusive, equitable, and quality education and lifelong learning opportunities for all (UNESCO, 2020). In this context, Education for Sustainable Development (ESD) has emerged as a transformative force, equipping learners with the knowledge, skills, values, and attitudes necessary to address complex global challenges such as climate change, social inequality, and environmental degradation. Central to this educational transformation are teachers, who are not only facilitators of learning but also agents of change. Their professional competencies and preparedness directly influence the ability of education systems to contribute to sustainable national development (UNESCO, 2021; OECD, 2022).

In Cameroon, like in many developing nations, teacher professionalization has traditionally focused on rigid, standardized training programs that emphasize content mastery over innovation, creativity, and responsiveness to real-world issues (Tambo, 2020; Neba & Mba, 2023). Observations and feedback from teachers indicate that the secondary school curriculum is excessively overloaded. This heavy content load hampers effective teaching and significantly limits students' ability to develop essential skills. As teachers rush to cover the vast syllabus within limited timeframes, they often cannot explore subjects in depth - leading to shallow understanding and diminished learning outcomes for students (Lawyer, 2019). While these programs have contributed to increasing the quantity of trained teachers, questions remain about their quality and relevance to 21st-century educational demands. The gap between teacher training curricula and classroom realities often results in an ill-equipped workforce to integrate sustainability principles or foster critical thinking and problem-solving skills among learners (Beyoh, 2024). Moreover, with rapid technological advancements and socio-environmental shifts, teachers require continuous, context-specific professional development to remain effective and relevant (Ngolowu & Asare, 2023).

The concept of teacher professionalization in this study is framed within a transformative paradigm, one that views professional growth not as a static event but as a lifelong process that must align with national development priorities and global sustainability commitments. A rethinking of strategies is needed, focusing on interdisciplinary approaches, integration of ESD principles, utilization of digital tools, and fostering collaborative learning environments (Sillah & Mofor, 2022; World Bank, 2022). These new pathways emphasize not only the development of pedagogical skills but also values such as inclusivity, resilience, adaptability, and environmental stewardship, core to sustainable education. Lawyer (2021) argues that the 21st-century society is driven by the digital revolution, which requires teachers to reconsider their pedagogic practices to

embrace the dynamism learners bring to the classroom and the learning process. She further proposes the need for new philosophies of education, theoretical perspectives and teaching/learning models that are contextually relevant and can address the needs of the 21st-century generation of learners.

Furthermore, education policies in Cameroon have acknowledged the need for teacher reform, yet implementation remains weak due to systemic challenges such as inadequate funding, lack of continuous professional development (CPD) structures, poor supervision, and limited stakeholder engagement (Ministry of Basic Education (MINEDUB, 2021). This reality underscores the urgency of investigating and reimagining teacher professionalization through empirical research that reflects the voices of teachers and educational administrators, and offers evidence-based, scalable recommendations. This study is therefore situated at the intersection of policy, practice, and pedagogy. Examining current gaps and opportunities in teacher professional development, it seeks to contribute to the broader discourse on how education systems in sub-Saharan Africa can better align with the goals of sustainable national development. Specifically, it aims to provide practical and innovative models for teacher professionalization that are rooted in Cameroonian realities while resonating with global educational reform trends.

Education for Sustainable Development (ESD)

Sustainable development is about living well today without stealing the chance for future generations to do the same; World Commission on Environment and Development. (1987). Our common future. Education for Sustainable Development (ESD) invites us to rethink how we teach and learn - not just by adding topics like climate change or recycling to the curriculum, but by reshaping the very purpose and process of education itself (Sterling, 2001). ESD should therefore empower learners of all ages to take responsibility for building a better future. It encourages us to imagine new possibilities where human well-being, social justice, cultural richness, and the health of our planet are deeply connected. It's not just about knowledge, but about nurturing values, attitudes, and skills that help us respond to complex challenges with creativity and compassion.

Rather than sticking to traditional teaching methods, ESD embraces approaches like systems thinking, critical reflection, participatory learning, and interdisciplinary collaboration (UNESCO, 2020). It also welcomes more transformative strategies - learning rooted in place and community, envisioning alternative futures, and encouraging students to become active participants in shaping their world (Sterling, 2012; Tilbury, 2011). These approaches help learners develop the competencies needed to tackle issues like climate change, inequality, and resilience. They also invite educators to move beyond the conventional teacher-student dynamic and foster learning environments built on dialogue, empowerment, and shared responsibility. Yet, as Reid *et al.* (2021) point out, progress has been slow. One of the most effective ways to bring ESD to life is through a whole-school approach (Mogren *et al.,* 2019). This means involving everyone - students, teachers, staff, and the wider community - in creating a culture of sustainability. It links classroom learning with school operations and community engagement (Tilbury, 2022), encouraging students to take part in decision-making, local projects, and global initiatives (Henderson & Tilbury, 2004).

Teacher education is at the heart of this transformation. Teachers are powerful agents of change, and their ability to foster sustainable thinking depends not only on their own knowledge and values but also on the support they receive from institutional frameworks and curricula. That's why international declarations like the UNECE Strategy (2005) and the Bonn Declaration (UNESCO,

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2009) call for a reorientation of teacher education towards ESD. The Decade of Education for Sustainable Development (DESD) highlighted many inspiring examples. In 2011, for instance, Jamaica's Ministry of Education established 46 Centres for Environmental Education and Sustainability across the country. These centres trained nearly 9,000 teachers through 184 seminars, helping them bring ESD into their classrooms and communities (UNESCO, 2014a).

Strengthening Teachers' Professional Learning in ESD

Empowering teachers through professional learning in Education for Sustainable Development (ESD) is key to effective classroom practice. Over recent years, various ESD competence frameworks have emerged to guide teacher development (Bürgener & Barth, 2018). These frameworks recognize teachers not just as educators, but as change-makers within their schools and the broader education system (Barth & Kater-Wettstädt, 2021). Embedding ESD throughout the entire teacher education journey from initial training to ongoing professional development is essential. Teachers need structured support to build foundational knowledge, shape their professional identity, and grow into confident ESD practitioners (Qi *et al.,* 2021). Continued learning helps them share best practices, stay current, and adapt to the evolving nature of sustainability education.

Developing ESD competences takes time. It's a non-linear process shaped by school environments, local communities, and professional networks (Réti, 2022). Effective professional learning should be long-term, collaborative, content-rich, and grounded in real-world practice (Darling-Hammond *et al.,* 2009, 2017). Another barrier to mainstreaming ESD is the lack of experienced educators equipped to lead change (Ryan & Tilbury, 2013). Teachers must be supported to challenge traditional learning models and influence broader educational practices. Participatory action research, for instance, offers a powerful way for educators to co-create strategies for sustainable transformation (Ferreira *et al.,* 2007). Above all, access to high-quality teaching resources is critical. While many materials exist online, schools need help identifying those that truly support ESD goals (UNESCO & Education International, 2021; McKeown, 2014). Resources should go beyond content; they should enable whole-school approaches and connect students to real sustainability challenges.

Theoretically, this study is anchored in a combination of transformative education theories, human capital theory, and constructivist perspectives on teacher professionalization. These perspectives collectively underscore the necessity for ongoing teacher development to align education with the demands of a rapidly changing world and the goals of Sustainable Development.

Transformative education theory, advocated by Mezirow (2000), posits that education should enable individuals to question their beliefs, reflect on their practices, and transform their perspectives to become more adaptable, responsible, and socially conscious practitioners. Within this framework, teacher professionalization is not a static process of acquiring knowledge; instead, it involves a deep transformation of attitudes, values, and pedagogy. This view underscores the necessity for teachers to move away from traditional delivery methods and become innovators, change agents, and leaders who can empower their students to tackle contemporary societal and environmental issues. Therefore, from a transformative standpoint, professional development must be designed to help teachers reflect critically on their practice, revise their perspectives, and align their pedagogy with the goals of education for sustainable development.

The human capital theory by Gary S. Becker (1930–2014), underscores education's role in developing human resources to drive economic and societal progress (Becker, 1993). Within this view, investing in teacher professionalization is an essential strategy to improve instructional delivery, raise education standards, and produce graduates who can contribute effectively to a knowledge-based and sustainable society. The theory advocates for education and training to match the skills demanded by a changing world. Consequently, teacher professional development should not be a mere formality; it must be purposeful, contextually relevant, and designed to empower educators to respond to the needs of their learners and their communities, thereby strengthening the human capital base of the nation.

Furthermore, constructivist perspectives, particularly those of Vygotsky (1978), view knowledge as a socially constructed phenomenon. According to this view, teacher professionalization should be interactive, collaborative, and inquiry-oriented, allowing educators to construct knowledge and skills through reflection, dialogue, and practice. The constructivist view underscores the importance of developing professional learning communities and mentoring structures where teachers learn from each other, reflect collectively on their practice, and innovate their pedagogy to align with ESD goals. Together, these perspectives illuminate the necessity for a transformative and context-specific approach to teacher professionalization in Cameroon, one that merges reflection, collaboration, and inquiry; develops human capital; and is profoundly informed by the principles of education for sustainable development. Such an approach holds the potential to produce a teaching force that is adaptable, skilled, socially responsible, and capable of shaping education in a way that directly contributes to the nation's sustainable development goals.

METHODOLOGY

This study adopted a convergent parallel mixed-methods design to provide a comprehensive understanding of teacher professionalization strategies in Cameroon, their alignment with Education for Sustainable Development (ESD) principles, and innovative pathways for enhancing teacher capacity and student learning outcomes. The mixed-methods design was chosen for its strength in integrating quantitative breadth with qualitative depth, allowing for the triangulation of data to capture both measurable trends and contextual insights. Quantitative data examined the extent and effectiveness of existing professionalization practices and innovative pathways, while qualitative data explored participants lived experiences, perceptions, and suggestions for improvement. This complementary approach ensured a holistic view of the teacher professionalization landscape across linguistic and regional contexts.

The study sample comprised 300 teachers and 30 educational administrators, drawn from public and private primary, secondary, and teacher training institutions in Cameroon's North West (English-speaking) and Littoral (French-speaking) Regions. A multistage sampling technique was employed: purposive sampling first identified the two regions to reflect linguistic and contextual diversity; stratified disproportionate random sampling ensured proportional representation across school levels; and simple random sampling selected the 300 teachers for the quantitative phase. Additionally, purposive sampling identified 14 administrators and 17 inspectors for qualitative interviews and Focus Group Discussions (FGDs), respectively. This combination of sampling methods ensured that participants represented diverse educational backgrounds and professional experiences relevant to teacher professionalization.

Data collection involved the use of a structured questionnaire for teachers, semi-structured interview guides for administrators and a focused group guide for inspectors. The questionnaire, based on a 4-point Likert scale, assessed teachers' perceptions of current professionalization programs, integration of ESD principles, and adoption of innovative models such as ICT-based and collaborative learning. The interview and FGD guides explored deeper issues related to policy implementation, institutional support, and innovative strategies for sustainable professionalization. Expert review and a pilot test with 18 teachers ensured content validity and refinement of the tools. A Cronbach's alpha reliability of 0.86 confirmed the internal consistency of the instrument. Quantitative data were analyzed using descriptive statistics (means, standard deviations, and frequencies), while qualitative data were analyzed through thematic analysis to identify recurring patterns related to ESD integration, capacity-building strategies, and innovative professionalization models. Ethical approval was obtained from relevant educational authorities, and all participants provided informed consent, with assurances of confidentiality, anonymity, and voluntary participation.

FINDINGS

Research Question 1: What are the gaps in current teacher professionalization approaches in Cameroon?

Table 1: Gaps in Current Teacher Professionalization Approaches in Cameroon

S/N	Statement	SA	A	D	SD	Mean	Std. Dev.	Decision
1	Teacher professional development programs are regularly organized for all teachers.	68	122	74	36	2.74	0.94	Agree
2	Existing professionalization programs address teachers' real classroom challenges.	54	113	91	42	2.63	0.96	Agree
3	There is adequate funding and institutional support for teacher professionalization activities.	38	77	112	73	2.27	0.99	Disagree
4	Training and workshops are equitably accessible to teachers across all regions.	41	83	108	68	2.32	0.97	Disagree
5	Professionalization initiatives are effectively monitored and evaluated by educational authorities.	47	89	104	60	2.41	0.95	Disagree
6	Current teacher training curricula are aligned with modern pedagogical and technological trends.	65	127	70	38	2.73	0.92	Agree

7	Teachers are motivated and encouraged to engage in continuous professional development.	58	118	80	44	2.63	0.95	Agree
8	There is a clear policy framework guiding teacher professionalization in Cameroon.	45	94	96	65	2.40	0.98	Disagree
9	Collaboration between training institutions and schools enhances professional growth.	72	133	63	32	2.82	0.90	Agree
10	Professionalization programs focus more on theory than on practical teaching improvement.	96	126	53	25	2.97	0.88	Agree

Table 1 presents the perceptions of teachers regarding the current professionalization approaches in Cameroon. The data reveal a mixed picture, where teachers generally acknowledge that professional development programs are organized and somewhat aligned with modern pedagogical trends, as seen in statements 1, 2, 6, 7, 9, and 10, which recorded mean scores ranging from 2.63 to 2.97. Teachers also recognize the collaboration between training institutions and schools, indicating that some efforts are made to integrate professional growth into practical teaching contexts. However, a recurring concern is the predominance of theory over practice in professional development programs, which suggests that teachers may not fully benefit from practical strategies to improve classroom performance. At the same time, the data show clear areas of weakness: statements 3, 4, 5, and 8, which relate to funding, institutional support, policy frameworks, and monitoring, received mean scores below 2.5, reflecting teachers' disagreement. This indicates systemic gaps in resources, oversight, and policy implementation, which undermine the overall effectiveness of teacher professionalization in Cameroon.

Another significant insight from Table 1 is the issue of motivation and continuous engagement in professional development. While statement 7 shows moderate agreement (Mean = 2.63), suggesting that teachers are motivated to some extent, this must be considered in light of other negative indicators, such as inadequate funding and policy support. The data imply that teachers may engage voluntarily in professional development, but structural and institutional factors limit sustained participation and meaningful outcomes. Overall, the survey responses highlight a discrepancy between the availability of professional development programs and their practical impact, revealing gaps that must be addressed to enhance teacher competence. These findings suggest that policymakers and educational authorities need to strengthen the systemic and operational foundations of teacher professionalization, including funding, monitoring, and policy clarity. Without addressing these gaps, the programs risk remaining superficial, failing to improve teaching quality in a meaningful and sustainable manner.

Table 2: Interview Findings on Gaps in Current Teacher Professionalization Approaches in Cameroon

Category of Variable	Questioning Themes	Response Themes	Key Statements from Interviewees
Policy and Institutional Support	1. How effective are existing policies and institutional structures in supporting teacher professionalization?	Inadequate policy implementation and weak institutional backing	"Although there are national guidelines, implementation at the school level is weak due to a lack of monitoring and follow-up." (Adm3). "There is no consistent framework guiding how teachers should engage in continuous professional development." (Adm8) "Support from higher authorities is irregular and often depends on available funding." (Adm12)
Accessibility and Equity in Professional Development	2. To what extent are professional development opportunities accessible to teachers across regions?	Unequal access and regional disparity	"Most workshops and seminars are concentrated in urban areas, leaving rural teachers behind." (Adm2) "Some teachers have never attended any professional development program in years." (Adm9) "Accessibility depends on whom you know or where you are posted." (Adm5)
Relevance and Quality of Professionalization Programs	3. How relevant are the existing professionalization programs to teachers' classroom realities?	Mismatch between training content and classroom challenges	"Many programs are theoretical and fail to address real classroom problems." (Adm1) "Trainers often use outdated methods and ignore current technological trends." (Adm6) "Teachers attend workshops but return to the same traditional practices." (Adm10)
Monitoring and Evaluation Mechanisms	4. How are professionalization initiatives monitored and evaluated?	Weak monitoring and lack of follow-up	"After workshops, there is no mechanism to assess whether teachers apply what they learned." (Adm7) "Evaluation reports are rarely produced or acted upon." (Adm11) "Supervisory visits do not emphasize professional growth but rather fault-finding." (Adm13)

| Motivation and Teacher Engagement | 5. What factors influence teachers' motivation to engage in continuous professionalization? | Low motivation due to poor incentives | "Teachers are not motivated because there are no rewards or recognition for attending training." (Adm4) "Professional development is seen as a burden since teachers have to cover costs themselves." (Adm14) "Without clear benefits, teachers lose interest in continuous learning." (Adm9) |

The interview data in Table 2 provides a richer understanding of the gaps highlighted in the quantitative survey. Administrators identified policy and institutional support as a major challenge, emphasizing weak implementation, irregular support from higher authorities, and a lack of consistent frameworks guiding continuous professional development. Interviewees highlighted that while national guidelines exist, there is limited follow-up and monitoring, leaving schools and teachers without clear direction or accountability. This qualitative insight aligns with teachers' survey responses in Table 1, where funding, policy clarity, and monitoring were identified as gaps. The interviews thus reinforce the idea that systemic issues are central to the inadequacies in Cameroon's professionalization approaches.

Accessibility and equity in professional development emerged as another major gap. Administrators reported that workshops and seminars are largely concentrated in urban areas, leaving rural teachers underserved and sometimes completely excluded from professional growth opportunities. Some teachers have never attended any training in years, and access often depends on personal networks or postings, reflecting a clear regional disparity. This theme mirrors the quantitative findings in Table 1, where teachers disagreed that training is equitably accessible across all regions. The interviews also revealed that the relevance and quality of professionalization programs are insufficient, with training often being theoretical, outdated, and disconnected from real classroom challenges. Teachers return to schools without practical strategies to improve student learning, which weakens the intended outcomes of these programs.

Monitoring and evaluation were highlighted as weak points in the professionalization system. Administrators noted that workshops and training programs are rarely followed up with assessments, supervisory visits focus more on fault-finding than professional growth, and evaluation reports are seldom produced or acted upon. This lack of accountability reinforces the survey findings that professionalization initiatives are not effectively monitored. Motivation and teacher engagement were also affected by poor incentives, with teachers bearing the cost of training themselves and receiving little recognition or reward for participation. These qualitative insights demonstrate that structural, logistical, and motivational factors are deeply intertwined, collectively creating significant gaps in Cameroon's current approaches to teacher professionalization.

Research Question Two: How can Education for Sustainable Development (ESD) principles inform teacher professionalization strategies in Cameroon?

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Participants:

Group 1 (G1): 8 Inspectors of Secondary Education (From North East Region)

Group 2 (G2): 9 Inspectors of Secondary Education (From Littoral)

Question 2a: In what ways can Education for Sustainable Development (ESD) principles be integrated into teacher professionalization programs in Cameroon?

Group 1 (G1) Response Summary: Participants agreed that ESD principles should be embedded in both in-service and pre-service teacher training programs. They emphasized revising teacher education curricula to include sustainability themes such as environmental stewardship, social responsibility, and peace education. Professionalization should move beyond pedagogy to include values like sustainability, global citizenship, and responsible resource use," one inspector noted.

Group 2 (G2) Response Summary: Participants suggested incorporating ESD modules that promote interdisciplinary teaching within professionalization courses. They proposed aligning teacher training outcomes with the Sustainable Development Goals (SDGs).

"ESD principles can make teachers agents of change who connect classroom lessons with community realities," added another participant.

Question 2b: How can the integration of ESD principles enhance teachers' professional competencies?

Group 1 (G1) Response Summary: Inspectors highlighted that ESD promotes critical thinking, problem-solving, and lifelong learning, competencies essential for teachers to guide students in addressing local and global challenges. ESD training develops teachers' ability to integrate environmental, economic, and social issues into lessons," said one inspector.

Group 2 (G2) Response Summary: Participants believed ESD would encourage innovation and reflective practice. They added that it empowers teachers to adapt to change and model sustainable behaviour in their schools. Teachers who understand ESD become role models for sustainability both in and out of the classroom," a G2 member commented.

Question 2c: What barriers currently hinder the integration of ESD principles into teacher professionalization programs?

Group 1 (G1) Response Summary: Participants cited the absence of national ESD policy frameworks, limited resources, and inadequate training of teacher educators. Most professional development workshops focus on syllabus coverage rather than sustainability or innovation," one inspector observed.

Group 2 (G2) Response Summary: Group members pointed out weak coordination between the Ministry of Education and teacher training institutions, a lack of instructional materials, and insufficient awareness of ESD concepts among teachers. There is still confusion about what ESD really means and how it should be implemented," said a G2 participant.

Question 2d: What strategies can be used to promote ESD-oriented professional development for teachers?

Group 1 (G1) Response Summary: Suggestions included developing national ESD guidelines, organizing regional workshops, and integrating sustainability case studies in continuous

professional development (CPD) sessions. "Teacher training colleges and inspectorates should collaborate to design practical ESD training models," one participant recommended.

Group 2 (G2) Response Summary: Participants proposed using blended learning platforms, school-based projects, and partnerships with NGOs working on sustainability. They also recommended incentives for teachers who implement ESD initiatives. "Recognition and motivation can drive teachers to embed sustainability in daily teaching," a participant explained."

Question 2e: How can the implementation of ESD in teacher professionalization improve student learning outcomes?

Group 1 (G1) Response Summary: Inspectors argued that ESD encourages experiential learning, which improves students' engagement, creativity, and problem-solving ability. "When teachers apply sustainability concepts, students learn to think critically about real-life challenges," one noted.

Group 2 (G2) Response Summary: Participants added that ESD-based teaching produces well-rounded learners who value environmental protection, peace, and equity. "Such students become responsible citizens capable of contributing to national development," a participant concluded.

Research Question Three: What innovative professionalization pathways can enhance teacher capacity and student learning outcomes?

Table 3: Innovative Professionalization Pathways to Enhance Teacher Capacity and Student Learning Outcomes

S/N	Statement	SA	A	D	SD	Mean	Std. Dev.	Decision
1	Integrating digital technology in professional development programs enhances teachers' instructional skills.	118	132	38	12	3.19	0.82	Agree
2	Peer mentoring and coaching among teachers improve classroom performance and innovation.	106	139	41	14	3.12	0.84	Agree
3	Online and blended learning platforms are effective tools for teacher professionalization.	95	128	54	23	2.98	0.89	Agree
4	Collaborative learning communities help teachers share innovative teaching practices.	109	137	39	15	3.13	0.83	Agree
5	Research-based professional learning strengthens teachers' problem-solving and reflective capacities.	101	142	43	14	3.10	0.82	Agree
6	Incorporating sustainability and ESD principles in training enhances	94	136	48	22	3.01	0.88	Agree

	teachers' ability to address real-life societal issues.							
7	Continuous capacity-building workshops focused on innovation improve student learning outcomes.	112	134	38	16	3.14	0.84	Agree
8	Integrating ICT tools in teacher professionalization fosters creativity and learner engagement.	119	128	36	17	3.16	0.83	Agree
9	School-university partnerships can strengthen innovative professionalization pathways for teachers.	105	132	46	17	3.08	0.86	Agree
10	Innovative professionalization models have a positive impact on both teacher competence and student achievement.	122	126	36	16	3.18	0.82	Agree

Table 3 provides quantitative insights into the innovative pathways that can strengthen teacher professionalization and ultimately improve student learning outcomes in Cameroon. The results indicate strong agreement across all ten statements, with mean values ranging from 2.98 to 3.19, showing a clear consensus that innovative approaches are essential for strengthening teacher capacity. The highest mean (3.19) corresponds to the integration of digital technology in professional development, suggesting that teachers see ICT as a major catalyst for enhanced instructional skills and classroom innovation. Peer mentoring, collaborative learning communities, and ICT-integrated training also scored highly, indicating that teachers recognize the value of cooperative and technology-driven learning models. These findings reflect a shift toward more modern, interactive, and practice-oriented forms of professional development, contrasting sharply with traditional lecture-based approaches that often dominate existing training programs.

Additionally, teachers strongly agreed that research-based learning, sustainability principles, and continuous capacity-building workshops are crucial for strengthening their professional competencies. These components emphasize reflective practice, problem-solving, and alignment with real-life societal challenges, skills that are increasingly vital in modern education systems. The consistently high mean scores suggest that teachers are not only aware of these innovative pathways but are also ready to embrace them if adequate support and opportunities are provided. There is also strong support for school-university partnerships, which teachers believe can provide access to expertise, modern methodologies, and updated pedagogical resources. Overall, the quantitative findings reveal a clear desire among teachers for professionalization models that are technology-driven, collaborative, practical, and grounded in research and sustainability principles.

Table 4: Interview Findings on Innovative Professionalization Pathways to Enhance Teacher Capacity and Student Learning Outcomes

Category of Variable	Questioning Themes	Response Themes	Key statements from interviewees
Digital Technology Integration	1. How can digital tools and online platforms be integrated into teacher professional development?	• Adoption of ICT-based training • Use of blended learning platforms • Integration of digital pedagogy in workshops	"Teachers need continuous training in digital tools like Google Classroom and Zoom to make lessons more interactive." (Adm 2) "Blended learning should be a key component of all professionalization programs." (Adm 8) "ICT integration motivates both teachers and learners toward creativity." (Adm 13)
Peer Mentoring and Collaboration	2. In what ways can peer mentoring and collaborative learning communities enhance teacher professional growth?	• Peer mentoring and coaching • Collaborative reflection and feedback • Learning communities and team teaching	"Mentoring relationships among teachers promote innovation and help weaker teachers build confidence." (Adm 1). "Collaborative platforms allow teachers to exchange effective classroom practices." (Adm 5) "Professional learning communities encourage teachers to solve classroom challenges collectively." (Adm 9)
Research-Based and Continuous Learning	3. How does research-based and continuous professional learning contribute to teacher and student improvement?	• Research-informed teaching • Reflective practice • Continuous workshops and seminars	"Teachers who engage in research improve their instructional design and problem-solving skills." (Adm 3). "Regular workshops on innovative strategies help sustain quality teaching." (Adm 6) "Reflective practices derived from research strengthen teachers' analytical abilities." (Adm 10)
Sustainability and ESD Principles	4. How can sustainability and Education for Sustainable Development (ESD)	• Integration of real-life issues • ESD-based pedagogical models	"Professional training should equip teachers to link classroom lessons to real-life sustainable issues." (Adm 4) "Embedding ESD concepts makes learning

	principles be embedded in teacher professionalization?	• Promotion of environmental and societal awareness	relevant and value-driven." (Adm 7) "Teachers must be trained to develop learners' problem-solving skills around community and environmental challenges." (Adm 12)
Institutional and External Partnerships	5. What role do partnerships and institutional collaborations play in enhancing innovative professionalization?	• School-university collaborations • Networking with educational organizations • Policy and institutional support	"Partnerships with universities help schools access modern training resources." (Adm 11) "Collaborations ensure that professional development remains aligned with global educational standards." (Adm 14) "External partnerships can sustain innovation through shared expertise." (Adm 9)

The interview findings in Table 4 further expand on the quantitative data by providing deeper insights into the innovative professionalization pathways teachers and administrators consider effective. Administrators emphasized the critical importance of digital technology integration, noting that tools such as Google Classroom, Zoom, and blended learning platforms are vital for modern professional development. They stressed the need for continuous ICT training to help teachers design interactive, engaging lessons. These views align strongly with the quantitative finding that digital technology enhances instructional skills. Administrators also highlighted that digital pedagogy motivates both teachers and learners, making technology a central pillar of innovative professionalization. This reinforces the idea that the future of teacher development in Cameroon must include comprehensive ICT training.

Peer mentoring and collaboration also emerged as a major theme, with administrators observing that mentoring relationships help weaker teachers build confidence and improve their teaching practices. Collaborative learning communities enable teachers to share experiences, reflect on challenges, and adopt best practices from colleagues. Administrators noted that these communities promote collective problem-solving, creativity, and professional solidarity, qualities essential for sustained improvement in teacher capacity. The interview data also emphasize the importance of research-based professional learning, stating that teachers who engage in research become more reflective, analytical, and effective in addressing classroom challenges. Continuous workshops and seminars further ensure that teachers remain updated on innovative instructional strategies and global trends.

A significant qualitative insight relates to the integration of sustainability and Education for Sustainable Development (ESD) principles into teacher training. Administrators believe teachers must be equipped to link classroom content to real-life societal and environmental issues, making learning both relevant and value-driven. Embedding ESD concepts in professionalization helps learners develop critical problem-solving skills for addressing community challenges. Finally, administrators stressed the importance of institutional and external partnerships, particularly school-university collaborations, which can provide modern training resources, mentorship, and

global educational standards. These partnerships help sustain innovation by allowing schools to tap into specialized expertise and broader professional networks. Together, these qualitative findings underscore that innovation in teacher professionalization must be holistic, collaborative, and anchored in real-life educational demands.

DISCUSSION OF FINDINGS

Gaps in Current Teacher Professionalization Approaches in Cameroon

The findings from both the quantitative results and qualitative interviews consistently reveal substantial gaps in Cameroon's teacher professionalization system. Teachers acknowledged the presence of development programs yet emphasized that these initiatives are often theoretical and detached from practical classroom realities. The low mean scores for funding, accessibility, monitoring, and policy support demonstrate that the structural environment required for effective professionalization remains weak. Such gaps reflect broader problems identified in African teacher development systems, where insufficient funding, weak governance structures, and inconsistent policy implementation diminish the impact of training initiatives (Darling-Hammond *et al.,* 2017). Administrators further highlighted that professional development remains sporadic, urban-centred, and driven more by syllabus demands than by modern pedagogical frameworks. The mismatch between training content and classroom needs echoes findings from Osafo and Asare (2020), who noted that many African teachers attend workshops without gaining practical strategies for improving student learning. The combined findings show that although professional development opportunities exist, they do not translate into meaningful changes in instructional practice due to systemic weaknesses and poor implementation structures.

A second major gap arising from the data relates to equity and accessibility in opportunities for professional growth. Teachers in rural areas consistently lack access to workshops, seminars, and quality in-service training, a challenge echoed by administrators who noted that access often depends on personal networks and geographical location. This aligns with empirical studies showing that rural teachers across Sub-Saharan Africa face chronic exclusion from capacity-building opportunities, which further widens the pedagogical divide between urban and rural schools (Tattoo, 2018). The underrepresentation of rural teachers in training initiatives also undermines national goals of ensuring quality and inclusive education for all learners. Additionally, interviewees reported weak monitoring and follow-up mechanisms, which means that even when teachers attend workshops, there is little accountability regarding classroom implementation. This mirrors findings by Schneck and Biyong (2021), who found that Cameroon's supervisory systems focus more on administrative compliance than on instructional improvement. Thus, the gaps in accessibility, monitoring, and practical relevance collectively weaken the professionalization landscape and hinder teachers' ability to respond effectively to contemporary classroom challenges.

Integration of Education for Sustainable Development (ESD) Principles in Teacher Professionalization

The findings demonstrate that stakeholders widely recognize the potential of ESD principles to transform teacher professionalization in Cameroon. Inspectors emphasized the importance of embedding sustainability themes such as environmental stewardship, peace education, global citizenship, and responsible resource use within both pre-service and in-service programs. This

aligns with UNESCO (2020), which highlights the role of ESD in equipping teachers with the competencies needed to address global challenges such as climate change, inequality, and unsustainable resource consumption. Participants further observed that ESD supports the development of critical thinking, problem-solving, reflection, and innovation, skills essential for 21st-century teaching. Research by Mogensen and Schnack (2019) similarly emphasizes that ESD promotes inquiry-based learning and enables teachers to link classroom content to real-life issues. Therefore, integrating ESD into teacher training not only enhances teacher competencies but also ensures that learners develop the capacities required for sustainable national development.

Despite the recognized importance of ESD, both groups of inspectors highlighted several barriers that hinder its integration into professionalization strategies. These include the absence of a national policy on ESD, limited resources for sustainability education, and inadequate preparation of teacher educators. Empirical studies confirm that African education systems often lack coherent national frameworks for ESD implementation, leading to inconsistent integration in curricula and training programs (Wals, 2021). Participants also noted weak coordination between the Ministry of Education, teacher training colleges, and inspectorates, which further complicates efforts to institutionalize ESD-based professional development. Additionally, teachers' limited awareness or understanding of ESD concepts hampers effective classroom implementation, a finding supported by Chinedu and Nwafor (2022), who reported low levels of ESD literacy among teachers in West Africa. These barriers indicate that without strong policy direction, adequate funding, and institutional coordination, ESD integration will remain fragmented and ineffective. The findings therefore point to the need for deliberate strategies such as national ESD guidelines, collaborative training models, and incentives for teachers who adopt sustainability-focused pedagogies.

Innovative Professionalization Pathways to Enhance Teacher Capacity and Student Learning

Results from the quantitative survey demonstrate strong teacher support for innovative professionalization pathways, with high mean scores across digital technology integration, peer mentoring, collaborative learning communities, and research-based learning. This suggests growing teacher readiness to embrace modern, interactive models of professional development that go beyond traditional lecture-based approaches. The strong endorsement of ICT-based training aligns with global evidence that digital tools enhance instructional quality, learner engagement, and teacher confidence (Koehler & Mishra, 2018). Interview findings support this, showing that administrators believe tools such as Google Classroom, Zoom, and blended learning platforms are crucial for equipping teachers with digital competencies. They further emphasized that continuous ICT training promotes innovation and creativity, aligning with OECD (2021) findings that digitally competent teachers are more adaptable and effective. These quantitative and qualitative insights collectively highlight that digital integration is not just a preference but a necessity for modern professionalization.

Another important innovative pathway identified is collaboration through peer mentoring, learning communities, and school-university partnerships. Administrators noted that mentoring relationships help weaker teachers build confidence, promote reflective practice, and support collective problem-solving within schools. This is consistent with Vescio, Ross, and Adams (2008), who found that professional learning communities significantly improve teacher practice and student achievement. Research-based professional learning also emerged as a vital innovation,

with teachers agreeing that engaging in research strengthens their analytical and problem-solving skills. Empirical literature supports this: Cochran-Smith and Lytle (2009) argue that inquiry-oriented professional development leads teachers to make more informed instructional decisions. Additionally, integrating sustainability and ESD principles into innovative training pathways ensures that teachers address real-life societal challenges in their classrooms. Institutional partnerships, particularly with universities and educational organizations, were also identified as essential for sustaining innovation through modern resources, shared expertise, and alignment with global educational standards. Together, these findings demonstrate that innovation in teacher professionalization must be multifaceted, practical, technology-driven, and grounded in collaboration and research to improve student learning outcomes sustainably.

CONCLUSION

The study revealed that while teacher professionalization programs in Cameroon are available and somewhat aligned with modern pedagogical trends, they remain largely ineffective due to systemic, structural, and operational deficiencies. Quantitative findings showed that teachers moderately agree that some professional development activities are organized and that collaboration between training institutions and schools exists. However, major gaps persist, including inadequate funding, weak monitoring and evaluation systems, inequitable access (especially for rural teachers), and the absence of a clear and consistently implemented policy framework.

Qualitative interviews reinforced these challenges, highlighting theoretical and outdated training content, a lack of follow-up after workshops, low teacher motivation due to poor incentives, and urban-rural disparities in access to professional development. Furthermore, the study established that Education for Sustainable Development (ESD) principles offer a promising direction for transforming teacher professionalization by promoting critical thinking, problem-solving, innovation, and real-life relevance in teaching. Teachers also strongly support innovative pathways such as ICT integration, peer mentoring, collaborative learning communities, research-based learning, and school-university partnerships.

Therefore, the findings demonstrate that Cameroon's teacher professionalization system requires major reform, one that strengthens institutional support, improves relevance and accessibility, integrates ESD principles, and embraces modern, innovative approaches that build teacher capacity and improve student learning outcomes.

IMPLICATIONS OF THE FINDINGS

The findings show that professionalization efforts lack consistency, monitoring, and adequate policy direction. This implies that without stronger institutional frameworks, clear policies, dedicated funding, and effective monitoring, teacher professionalization will continue to have minimal impact on instructional quality.

The disparity in access between rural and urban teachers suggests that national education quality cannot improve uniformly unless professional development opportunities are equitably distributed. Teachers working in underserved regions often struggle to build the skills they need, and without the right support, the gap in learning opportunities between communities can grow even wider.

Teachers' strong support for technology integration, peer mentoring, research-based learning, and ESD principles implies that adopting these approaches can significantly enhance teacher capacity. If implemented, these innovations could shift professionalization from theory-driven workshops to more practical, transformative models that boost student engagement and achievement.

RECOMMENDATIONS

The Ministry of Education should establish a clearly defined policy framework that outlines standards, roles, and structures for continuous professional development. This must be accompanied by dedicated funding to ensure consistent implementation, monitoring, and equitable access across all regions.

Teacher training colleges, inspectorates, and schools should collaborate to implement continuous ICT-based training, peer coaching systems, collaborative learning communities, and partnerships with universities to ensure ongoing access to research, expertise, and modern pedagogical resources.

Teacher education curricula should be revised to incorporate ESD themes such as sustainability, global citizenship, peace education, and community problem-solving. Regular CPD workshops should include practical ESD modules, supported by national guidelines, instructional materials, and incentives for teachers who implement sustainability-oriented practices.

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