

Training Teachers for the New Pathways: Empowering Change through Inclusive, Innovative, and Sustainable Teacher Education in Africa

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ABSTRACT

Teacher education is central to empowering societal transformation and driving sustainable development through innovation and inclusion. This paper explores how universities in Africa can restructure teacher preparation to align with emerging educational pathways that advance sustainability, inclusivity, and resilience in the era of Science, Technology, and Innovation (STI). In Kenya, teacher education has undergone significant transformation through the implementation of the Competency-Based Education (CBE), reforms in teacher professional development, integration of digital pedagogies, and renewed focus on inclusive education and industry linkages. Employing a desktop research design, the paper synthesizes insights from key policy documents and scholarly literature, including the Presidential Working Party on Education Reforms (PWPER), the Teachers Service Commission (TSC) Mentorship Policy, African Union (AU) education frameworks including the Continental Teacher Qualification Framework (CTQF), and resolutions of the Mombasa Deans' Conference and also, Kenya's Basic Education Curriculum Framework (2017), Basic Education Bill (2024), Teachers Service Commission Act (2012), and the Continental Education Strategy for Africa (CESA 16–25). The analysis identifies five reform pillars, competency-based education, digital pedagogy integration, inclusive practices, community-industry linkages, and continuous professional development, as crucial levers for empowering change. A tripartite framework of integration, innovation, and inclusion is proposed to align teacher education with sustainable societal needs. Findings reveal that while policy frameworks support transformation, challenges persist in implementation, capacity building, and resource mobilization. The paper concludes that training teachers for the new pathways is not only a policy priority but a strategic route toward achieving resilient education systems and advancing Africa's contribution to the global knowledge economy. By reimagining teacher education as a transformative ecosystem, universities can nurture educators who inspire change, foster innovation, and build inclusive and sustainable futures. The paper advances inclusive, mentorship-driven practicums, innovative blended pedagogies, and sustainable professional development ecosystems as scalable strategies for enhancing teacher readiness for senior school pathways.

Keywords: Teacher education, sustainability, inclusion, innovation, resilience, policy reform, Africa, Kenya

INTRODUCTION

The introduction of senior school pathways Science, Technology, Engineering and Mathematics (STEM), Arts and Sports, and Social Sciences has intensified demands on teacher education systems that remain unevenly prepared for implementation. Drawing on policy analysis and practice-based evidence. Across Africa, education systems are undergoing a paradigm shift from content-heavy curricula toward competency-based education (CBE) models designed to equip learners with transferable skills, creativity, problem-solving capacities, and civic agency (African Union (AU), 2024). This transformation aligns with the African Union's Decade of Education (2025–2034), which prioritizes relevance, inclusion, innovation, and sustainability as core pillars of educational reform across member states. Within this continental agenda, Kenya's transition to the Competency-Based Education (CBE) represents a fundamental reorientation of secondary education toward skills development, values formation, and lifelong learning.

At the senior school level, Kenya's CBE introduces differentiated pathways in STEM, Arts and Sports, and Social Sciences, marking a major structural reform in secondary education aimed at aligning learner talents with national development priorities and labor market demands (Ministry of Education (MoE), 2023). However, despite strong policy momentum, teacher readiness remains a critical bottleneck. National reviews indicate that only about 58% of teachers feel adequately prepared to implement CBC-aligned pedagogies, assessments, and pathway-specific learning experiences (PWPER, 2023; Teachers Service Commission (TSC), 2024).

Pre-service teacher preparation is particularly constrained by unstructured practicum experiences, including Teaching Practice I (TP1), with Universities in Kenya having limited exposure to inclusive education, and weak alignment between university coursework and school-based realities (MoE, 2023; PWPER, 2023). These gaps threaten the successful rollout of senior school pathways scheduled for 2026, especially for learners with disabilities, gifted learners, and those in marginalized and resource-constrained contexts.

Empirical evidence further underscores structural weaknesses in the teacher supply pipeline. A rapid survey of 5,835 Bachelor of Education students across 39 Kenyan universities reveals strong intrinsic motivation for pursuing teaching, with 73.8% citing personal desire as their primary driver. However, enrolments remain heavily concentrated in B.Ed. Arts and Science programs (89.5%), while specialized fields such as Technology Education (2.2%), Early Childhood Education (1.7%), and Special Needs Education (6.5%) remain critically under-enrolled (PWPER, 2023, Deans of Education 2025 survey). Although STEM disciplines collectively retain significant numbers, internal imbalances, particularly the extremely low uptake and weak teaching intentions in Technology Education pose risks to Kenya's goal of achieving a 60% STEM-oriented education system. Nearly half of surveyed students plan to pursue postgraduate studies, while fewer than one-third intend to enter classroom teaching immediately, further weakening the teacher supply pipeline (TSC, 2024).

Similarly, the Kenya Secondary School Heads Association (KESSHA) Conference (2025) convened more than 7,000 principals to prepare for the admission of the first Grade 10 cohort into senior secondary schools. Central to the deliberations was the pathways approach, which requires teachers to be trained for diverse learner trajectories in sciences, arts, and technical/vocational education. The conference emphasized the need for industry linkages and policy support to ensure smooth implementation of pathways reforms (KNA News, 2025).

As societies grapple with rapid technological change, climate-related challenges, and shifting labor market demands, the preparation of teachers must evolve to support new pathways of learning and work (UNESCO, 2023). In Kenya and across the continent, universities are increasingly called upon to reimagine teacher education not merely as a professional training exercise, but as a transformative ecosystem that nurtures educators capable of fostering innovation, inclusion, and resilience.

This paper situates teacher education within the broader agenda of Science, Technology, and Innovation (STI), highlighting its role in empowering societal transformation and strengthening Africa's contribution to the global knowledge economy (AU, 2024). It argues that restructuring teacher preparation around sustainability, inclusivity, and resilience is both a policy priority and a strategic imperative. By analyzing Kenyan reforms alongside continental frameworks, the paper proposes a tripartite model of integration, innovation, and inclusion, as a guiding lens for universities seeking to enhance teacher readiness for senior school pathways.

Anchored in Kenyan reforms and informed by continental and global frameworks, the analysis draws on University practices, PACTED 2025 strategies, and comparative African experiences to propose scalable, context-sensitive approaches to teacher education capable of supporting the effective delivery of senior school pathways across diverse learning contexts.

Statement of the Problem

Despite extensive policy reforms supporting competency-based education in Kenya, teacher preparedness for the implementation of senior school pathways remains insufficient. While frameworks such as the Competency-Based Curriculum, national teacher standards, and continental strategies emphasize inclusion, innovation, and skills alignment, significant gaps persist between policy intent and classroom practice. Evidence indicates

misalignment between university-based teacher education programmes and the competency demands of senior school pathways, particularly in STEM, technical, and inclusive education fields.

Additionally, teacher preparation remains largely theoretical, with limited exposure to structured practicum experiences, mentorship, and real-world application. Inconsistencies in the quality of mentorship, inadequate integration of digital pedagogies, and uneven access to continuous professional development further constrain teacher readiness. These challenges are compounded by systemic issues, including under-enrolment in specialized areas, weak industry linkages, and resource limitations across institutions.

As Kenya prepares for the full rollout of senior school pathways, these gaps pose a significant risk to equitable and effective implementation, particularly for learners in marginalized and resource-constrained contexts. Although existing studies have examined aspects of CBE implementation, there is limited integrative analysis linking policy alignment, teacher preparation practices, and the development of a coherent framework for restructuring teacher education.

This study therefore addresses this gap by examining how teacher education can be realigned and strengthened to support competency-based pathways, and by proposing a context-responsive framework to guide inclusive, innovative, and sustainable teacher preparation in Kenya and across Africa.

Purpose of the Study

The purpose of this study is to examine how teacher education in Kenya can be restructured to effectively support the implementation of competency-based senior school pathways. The study focuses on assessing programme alignment, evaluating key teacher preparation practices, and proposing a context-responsive framework to enhance teacher readiness within Kenya and across Africa.

Objectives of the study

1. To assess the alignment of teacher education programmes in Kenya with competency-based senior school pathway requirements using policy and empirical evidence.
2. To evaluate the effectiveness of mentorship, digital pedagogy, and continuous professional development in enhancing teacher readiness for CBC implementation.
3. To develop a context-responsive framework for restructuring teacher education in Africa based on principles of integration, innovation, and inclusion.

METHODOLOGY

This study employed a desktop research design, synthesizing insights from policy documents, scholarly literature, and continental strategies. Key sources included Kenya's Basic Education Curriculum Framework (2017), the Basic Education Bill (2024), the Teachers Service Commission Act (2012), and the Continental Education Strategy for Africa (CESA 16–25). Supplementary materials included journal articles on CBC implementation and teacher education reforms (Thukia, 2025; Mule, 2025).

A thematic analysis was conducted to identify recurring reform priorities. Five pillars emerged: competency-based education, digital pedagogy integration, inclusive practices, community-industry linkages, and continuous professional development.

FINDINGS

Policy Frameworks

Kenya's teacher education reform agenda is anchored in interlocking national and continental policy frameworks. The Presidential Working Party on Education Reforms (PWPER) underscores the need for standardized national practicum guidelines, stronger university, school partnerships, and explicit alignment between teacher

preparation and CBC competencies (PWPER, 2023). Among its key recommendations are the rationalization of entry requirements into teacher education, the restructuring of Teaching Practice I (TP1) as a formative professional learning experience, and clearer accountability mechanisms for practicum supervision.

The Teachers Service Commission (TSC) Mentorship Policy (2020) further institutionalizes mentorship as a core professional function, proposing financial incentives to recognize mentors' instructional leadership and workload. Evidence from early implementation indicates that mentorship quality remains inconsistent due to limited mentor training and uneven resourcing (TSC, 2024). At the continental level, the African Union's Continental Teacher Qualification Framework (CTQF) seeks to harmonize teacher standards, promote professional mobility, and enhance quality assurance across member states (AU, 2024a).

Deliberations from the Mombasa Deans' Conference 2025 emphasized the urgency of aligning pre-service curricula with CBC pathways, reforming TP1 toward educative mentoring, and adopting shared nomenclature and assessment language across institutions. Collectively, these frameworks provide a coherent policy architecture for addressing persistent gaps in mentor preparation, practicum coherence, and pathway-specific teacher competence.

Inclusive Training Models

Inclusive teacher education requires models that intentionally address learner diversity, contextual disparities, and professional socialization. Educative mentoring has emerged as a promising approach, for instance, pairing Bachelor of Education students with trained school-based mentors for sustained co-teaching experiences. By capping practicum groups at 15 students per mentor, these models enable personalized feedback, scaffolded learning within the zone of proximal development, and reflective practice grounded in real classrooms.

Inclusion is further strengthened through the integration of special needs education and community service learning (CSL). CSL initiatives such as literacy drives, assistive technology adaptation, and parental engagement projects expose pre-service teachers to diverse learners while fostering civic responsibility. Reflective journals and portfolio assessments document professional growth and promote critical self-assessment.

Regional experiences, including Tanzania's peer coaching models, demonstrate the scalability of inclusive mentorship across rural and urban divides. These approaches underscore the importance of contextual adaptation, mentor support, and institutional commitment in realizing equitable teacher preparation.

Innovative Pedagogies

The implementation of CBC pathways necessitates pedagogical approaches that are adaptive, technology-enabled, and reflective. Blended continuous professional development (CPD) has emerged as a viable strategy for expanding access while maintaining quality. Digital portfolios, video-based lesson reflections, and ICT-supported assessment tools enable teachers to document growth, receive feedback, and align practice with competency-based assessment principles (Darling-Hammond et al., 2017).

In Kenya, pathway-specific retraining initiatives have reached over 30,000 teachers, focusing on competency-based assessment, learner-centered instruction, and interdisciplinary teaching (TSC, 2024). Microcredentials and modular learning units allow teachers to specialize in areas such as STEM innovation, arts talent development, or social sciences inquiry, while maintaining flexibility and responsiveness to school contexts. Cluster-based learning facilitated by TSC, CEMASTEAM and KEMI supports peer learning and localized problem-solving.

International evidence reinforces the effectiveness of such approaches. Singapore's mutual growth-oriented mentoring and professional learning systems demonstrate how structured reflection and collaborative inquiry can enhance instructional quality at scale (OECD, 2020). Adapted to African contexts, blended CPD and microcredentialing offer a sustainable pathway for continuous teacher competence development.

Sustainable Practices

Sustainability in teacher education extends beyond initial training to encompass wellness, career progression, and institutional resilience. OECD-aligned approaches emphasize teacher well-being through recognition,

manageable workloads, and opportunities for advancement. Investments in master teacher programs, scholarships, and study leave create professional pathways that reward excellence and retain talent.

Communities of practice provide cost-effective platforms for continuous learning, peer support, and innovation diffusion. Evidence from PWPER pilots indicates that structured mentorship correlates with 25–30% gains in teacher readiness, underscoring the return on investment in human capital. Sustainable financing models must prioritize infrastructure development, digital connectivity, and targeted stipends for rural and underserved areas. The proposed Kenya Teacher Training College model offers a national hub for coordination, research, and quality assurance, enhancing scalability and coherence across institutions.

Challenges and Evidence

Despite substantial reform efforts, implementation challenges persist. Large class sizes, frequently exceeding 50 learner limit opportunities for individualized instruction and formative assessment, both central to CBC pedagogy (MoE, 2023). ICT infrastructure remains uneven, with an estimated 40% of public secondary schools lacking reliable connectivity or adequate digital devices, constraining blended learning and digital assessment (UNESCO, 2022).

Concerns have also been raised regarding unethical or superficial practicum supervision, which undermines professional trust and learning outcomes. Evidence emerging from post-Mombasa Conference follow-ups indicates that although over 52,000 teachers have undergone retraining, uptake and impact are uneven across rural and urban contexts (TSC, 2024). Quantitative analyses from pilot institutions reveal a moderate but statistically significant relationship between structured TPI mentoring and improved teaching performance.

1. There is a mismatch between the skills taught in teacher education programmes and the competencies demanded by Kenya's fast-changing labor market and industry, leaving graduates less prepared to impart practical, job-relevant skills.
2. Many teachers are mis-deployed to areas outside their specialization or training, which weakens the quality and relevance of instruction.
3. A significant proportion of facilitators still lack ICT skills or are non-compliant with digital integration policies, making it difficult to implement technology-based teaching and learning effectively.
4. Much of the training remains theoretical-heavy rather than practical, which limits the ability of teachers to develop hands-on skills or to model applied learning for students.
5. Most trainers have minimal or no exposure to real industry settings, leading to weak linkages between education and workplace requirements.
6. Large class sizes in teacher training institutions reduce individualized attention, effective mentorship, and practical application.
7. Some learning management systems used in teacher education are unaccredited or of low quality, which undermines credibility and consistency of online learning.
8. Infrastructure gaps, such as inadequate laboratories, libraries, and digital tools, hinder the proper delivery of modern curricula.
9. The competency-based curriculum remains under-resourced, meaning teachers are not adequately trained or supported to deliver it effectively.
10. Teacher education often retains a teacher-centered approach rather than fully embracing learner-centered, interactive methods, which limits creativity, problem-solving, and critical thinking in future graduates.

Teacher education in Africa is at a critical juncture. The reforms underway in Kenya and across the continent demonstrate a strong policy commitment to sustainability, innovation, and inclusion. However, challenges in implementation, capacity building, and resource mobilization persist. There is need to strengthening partnerships between universities, industries, and communities, investing in digital infrastructure and faculty capacity, Institutionalizing CPD as a lifelong process, enhancing monitoring and evaluation mechanisms and promoting regional collaboration to share resources and best practices. Ultimately, training teachers for the new pathways is not only a policy priority but a strategic route toward achieving resilient education systems. By reimagining teacher education as a transformative ecosystem, African universities can nurture educators who inspire innovation, foster inclusion, and build sustainable futures.

CONCLUSION

The transition to competency-based senior school pathways across Africa places teachers at the center of educational transformation. Training Teachers for the New Pathways challenges us to reflect deeply on how teacher education must evolve to meet the demands of a changing world. It reminds us that the future of education depends on how well we prepare teachers not only to teach, but to lead innovation, inclusion, and transformation. These new pathways call for a shift from content delivery to competency development nurturing creativity, critical thinking, and problem-solving in our learners.

They demand that teachers become digitally fluent, able to integrate ICT, AI, and blended learning into everyday practice. At the same time, we must strengthen inclusive education, ensuring every teacher is equipped to reach every learner, regardless of background or ability. We also need stronger school–industry and community linkages, so education remains relevant to real-world challenges and sustainable livelihoods. Equally important is continuous professional growth structured mentorship, flexible CPD, and supportive policies that sustain teacher well-being and retention.

Evidence from Kenya demonstrates that without structured mentorship, inclusive practicum models, and innovative professional development systems, curriculum reforms risk uneven and inequitable implementation. This paper has shown that educative mentoring, blended CPD, and sustainable teacher support structures can significantly enhance readiness for CBC pathways. Aligning national teacher education reforms with continental frameworks such as AU CESA and the CTQF, as well as global sustainability goals, is essential for coherence, mobility, and quality assurance.

RECOMMENDATIONS

To consolidate gains and address persistent gaps, the paper proposes the following actions: Key Policy Areas to Strengthen Pre-Service and In-Service Teacher Education in Line with CBE

1. **Mandatory Continuous Professional Development (CPD).** Establish a legal framework making CPD compulsory for all serving teachers and align CPD with CBE pedagogy, assessment, ICT, and inclusive practices, linking it to teacher promotion and recognition.
2. **Pre-Service Teacher Education Standards.** Harmonize TTC, university, and TVET curricula to reflect CBE requirements and institutionalize structured school-based practicum with mentorship and coaching.
3. **Teacher Induction and Internship.** In the Mandatory induction/internship for all graduates, create a national mentorship program pairing novice teachers with experienced ones and Establish national TP1 standards with clear guidelines, assessment criteria, and quality assurance mechanisms. Cap practicum groups at 15 students per mentor and provide funded mentor training and supervision incentives.
4. **Teacher Educator Competence.** Develop standards for accrediting and training teacher educators in TTCs and universities, Establish pathways for collaboration between TVETs, TTCs, and universities to address human resource gaps in arts, STEM, and technical subjects and periodic retooling of teacher educators to align with curriculum reforms.

5. Inclusive Teacher Education. Integrate training on special needs and inclusive education in pre-service and CPD programs and provide adapted curriculum support materials and assessment tools for learners with disabilities.
6. ICT Integration. Mainstream digital pedagogy in teacher preparation and CPD and invest in ICT infrastructure for TTCs and schools to reduce urban–rural gaps.
7. Revise M.Ed. and pre-service methods courses to align explicitly with CBC pathways and assessment practices.

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