



African Population and  
Health Research Center

## POLICY BRIEF



# TOWARDS INCLUSIVE STEM FUTURES: GENDER-RESPONSIVE INNOVATIONS IN 4 AFRICAN UNIVERSITIES

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## Executive Summary

Across Africa, women remain underrepresented in science, technology, engineering, and mathematics (STEM) fields even as access to higher education continues to expand. Four illustrative case studies from Zimbabwe, Tanzania, and Kenya demonstrate how gender-responsive interventions can drive progress at multiple levels: community, programmatic, institutional, and policy. These examples include innovation hubs at Bindura University of Science Education (BUSE), structured foundation programs at the Open University of Tanzania (OUT), institution-wide reforms at Women's University in Africa (WUA), and policy-led staff development initiatives at Kenya College of Accountancy (KCA) University. They show that staff development, the institutionalization of gender initiatives, and context-specific strategies are key to advancing gender equity and women's participation in STEM.

## What's at Stake?

STEM education serves as a cornerstone for innovation and socio-economic transformation by driving Agenda 2063's skills revolution anchored in science, technology, and innovation. It advances people-driven development by empowering women and youth, strengthening gender equality, and building the workforce required for Africa's industrialization, digital transformation, and self-reliance. Additionally, it advances SDG 4 and SDG 5 by expanding the equitable access to quality education and strengthening women's participation in science and innovation.

However, across Africa, women continue to face deep-rooted structural and cultural barriers that hinder their full participation. Persistent gender stereotypes that cast STEM as a "male domain," the scarcity of visible female role models, and teaching approaches that overlook the specific needs and experiences of women collectively limit their engagement and advancement in these fields.

Gender-responsive pedagogies, teaching, and institutional practices that account for women's specific contexts offer a pathway to equity. This brief distills findings from four African case studies to highlight models of inclusion in STEM higher education in Sub-Saharan Africa and guide policy responses.



## Research Overview

The findings presented in this brief were collected between May and July 2025. The guiding question was:

**What lessons can be drawn from existing pedagogical interventions in universities aimed at increasing STEM participation among under-represented groups, particularly women, and what factors contribute to their success or limitations?**

A qualitative embedded case study was used. The case study sites- Bindura University of Science Education (BUSE), Open University of Tanzania (OUT), Women’s University in Africa (WUA), and the Kenya College of Accountancy (KCA) University were purposively identified through a scoping review and stakeholder engagements with higher education stakeholders in Sub-Saharan Africa.

## What Works: Evidence from Four African Institutions

The four case studies demonstrate that achieving gender equity in STEM is not a matter of charity or individual heroism it is a systemic, achievable, and financially justified priority. African higher education institutions have already proven what works. What is needed now is:

- **Policy Coherence:** Align national frameworks, institutional strategies, and classroom practice around gender-responsive pedagogy
- **Sustained Financing:** Move beyond donor-dependent pilots to institutionalized, government-funded commitments
- **Institutional Accountability:** Tie funding, accreditation, and performance metrics to gender equity outcomes
- **Collaborative Learning:** Facilitate knowledge exchange and peer support among African HEIs
- **Strategic Partnerships:** Align efforts across governments, institutions, regional bodies, and development partners

Gender-Responsive STEM Innovations in Higher Education Institutions



The case studies showcase a range of innovative interventions that demonstrate how gender equity in STEM can be advanced through context-sensitive, multi-level strategies.



- **Bindura University of Science Education (BUSE)** in Zimbabwe. Community-based engagement has been central to promoting inclusion through Innovation Hubs and the integration of indigenous knowledge. By involving students in community projects—such as the Masawu products initiative—the Innovation Hub creates opportunities for female students to serve as role models, inspiring younger girls to pursue science-related courses and careers. The incorporation of indigenous knowledge also enhances the relevance of STEM education to local contexts, fostering greater participation by women.

**Result:** Expanded enrollment in STEM, particularly in programs linked to community needs.

**Key insight:** Incremental, locally grounded interventions can gradually shift cultural attitudes and attract women to STEM without necessitating major systemic overhauls.



- **Open University of Tanzania (OUT).** A targeted, programmatic intervention has been used to expand access through a dedicated foundation program for female science students. Combining residential and distance learning, the program employs gender-responsive pedagogies to support women from low-income and rural backgrounds.

**Result:** A remarkable 90% transition rate into tertiary STEM degrees, with 176 out of 188 participants enrolling in university.

**Key insight:** Barriers to women’s participation in STEM are largely structural and economic—not a reflection of capability—and when these barriers are addressed, marginalized women excel.



- **Women’s University in Africa (WUA),** Zimbabwe. It exemplifies institution-wide reform by embedding gender equity across its curricula, governance, and pedagogy. The university has introduced compulsory gender modules for all students, developed gender-focused degree programs, and mainstreamed gender considerations into strategic planning, budgeting, and institutional governance.

**Result:** Sustained growth in STEM enrollment, improved retention rates, and a transformative institutional culture.

**Key insight:** Lasting change requires systemic commitment from leadership and intentional resource allocation to advance gender equity.

- **KCA University in Kenya.** A gender-responsive reform has been driven by policy alignment through structured staff development. In response to national education reforms such as the Competency-Based Education (CBE), the university established the Center for Teaching and Learning Excellence (CTLE) to guide curriculum redesign and provide continuous professional development for faculty.

**Result:** Strong staff buy-in, effective adaptation to new pedagogical frameworks, and a scalable model for policy implementation.

**Key insight:** Institutionalized mechanisms for faculty development are critical to embedding pedagogical innovation, including gender-responsive teaching.

### Cross-Cutting Insights:

- **Multi-Level Interventions Matter:** gender-responsive pedagogy can take shape through grassroots, programmatic, institutional, and policy-driven initiatives.
- **Staff Capacity is Critical:** without lecturer training and upskilling, inclusive pedagogies remain limited in impact.
- **Context Sensitivity:** blending indigenous knowledge, flexible timetabling, and childcare-friendly approaches helps reach marginalized women.
- Without explicit institutional commitment and policy frameworks, gender initiatives remain isolated. Leadership must integrate gender into strategic planning, budgets, and accountability mechanisms. National policy frameworks that mandate gender-responsive pedagogy accelerate institutional adoption.

## Recommendations and Insights

**Develop structured multi-level strategies** by combining grassroots initiatives (e.g., innovation hubs) with institution-wide reforms and policy alignment, ensuring interventions reinforce each other.

**Prioritize staff training and professional development** in gender-responsive pedagogy, supported by continuous refresher courses and integration into faculty performance assessments.

**Expand flexible learning models** by scaling blended learning, childcare support, and flexible timetabling, particularly for women from rural and low-income backgrounds.

**Embed indigenous knowledge systems into STEM curricula** to enhance cultural relevance and attract women students from diverse communities.

**Strengthen monitoring and accountability** by requiring universities to report on gender equity indicators and linking these to national STEM policy implementation.

## Conclusion

Advancing gender equity in STEM requires context-sensitive, multi-level, and systemic approaches. The four case studies demonstrate that progress is achievable when inclusive pedagogies are embedded in community engagement, formal programs, institutional cultures, and policy-driven staff development. Sustaining these gains demands institutional commitment, alignment with national frameworks, and adequate financing that goes beyond donor dependence.

Strengthening accountability mechanisms, fostering collaboration among higher education institutions, and building strategic partnerships across governments, universities, regional bodies, and development partners are equally vital to ensure coherence, scalability, and lasting impact.

