



African Population and
Health Research Center

POLICY BRIEF



ENHANCING GENDER INCLUSION IN STEM EDUCATION IN AFRICA

Introduction

Gender disparities in Science, Technology, Engineering, and Mathematics (STEM) education continue to be a significant challenge across Africa. Two recent workshops, organized in collaboration with the African Population and Health Research Centre (APHRC), the Association for the Development of Education in Africa (ADEA), and the Southern African Regional Universities Association (SARUA), have been instrumental in providing critical insights into the current state of STEM education, with a specific focus on gender inclusion. These workshops have not only shed light on the issues but also engaged a wide range of stakeholders, including policymakers, educators, and the community at large.

This brief highlights the key outcomes of these workshops and provides policy recommendations to improve gender equity in STEM disciplines.

What We know

As a flexible and inclusive Pan-African organization, ADEA promotes high-quality education and training across Africa to drive accelerated and sustainable development. Similarly, SARUA serves as a vibrant regional membership organization representing the entire Southern African Development Community (SADC) higher education sector, addressing the diverse needs of public and private institutions.

Both organizations share a dedication to transforming education and training systems in Africa, with the common goal of promoting sustainable development across the continent.

During the co-creation workshops in early 2024, a wealth of crucial insights emerged, shaping our understanding of the current state of STEM education and gender inclusion. Some of the insights from the workshop include;

1. Promoting Female Participation in STEM

Many countries have launched initiatives to actively encourage female students to pursue STEM disciplines. These programs include recognizing top-performing female students, offering targeted scholarships at both the high school and university levels, and creating mentorship opportunities.

These efforts are vital for closing the gender gap in STEM, providing support and incentives for women to excel in these traditionally male-dominated fields.



2. Integrating Technology and Innovation

Several higher education institutions have successfully integrated cutting-edge technology and innovative teaching methods into their STEM programs, focusing on making these resources more accessible to female students. Initiatives such as science clubs, hackathons, and annual STEM tours are helping promote early interest in STEM careers among young women by providing hands-on experiences and role models.

3. Addressing Gendered Exclusion in STEM

The workshops highlighted the importance of inclusive teaching practices to combat social and gendered exclusion in STEM education. Institutions are urged to implement gender-transformative policies that promote greater female participation and leadership in STEM. By addressing systemic barriers and creating supportive environments, these policies aim to empower women to excel in STEM and take on leadership roles within the field.

4. The Role of Research and Policy Development

Establishing gender-focused research centers and creating SMART classrooms are being implemented to encourage more female students to pursue STEM courses. These efforts are backed by gender-responsive policies that seek to create an inclusive learning environment, making it easier for young women to succeed in STEM and to promote innovation in gender-related research.

5. Regional and Institutional Collaborations

The workshops highlighted the critical need for ongoing collaboration between African educational institutions, policymakers, and stakeholders. These cross-regional partnerships are essential for sharing best practices and scaling successful initiatives continent-wide, ensuring that innovative approaches to promoting women in STEM can reach broader populations and create lasting impact.



Policy Recommendations

Gender inequality in Science, Technology, Engineering, and Mathematics (STEM) represents a significant structural barrier to fully realizing Africa's developmental potential.

Despite growing awareness of the need for diversity and inclusion, women's underrepresentation in STEM—particularly at higher educational levels and in the workforce—persists due to a combination of socio-cultural, institutional, and policy-based factors.

The existing initiatives, while commendable, have yet to achieve meaningful gender parity. Thus, more comprehensive and targeted interventions are necessary to ensure women can pursue and thrive in STEM careers.

The following policy recommendations advocate for systemic changes that address the root causes of gender disparity in STEM. These strategies focus on increasing access to education through scholarships, adopting gender-transformative teaching practices, investing in technological infrastructures, promoting cross-regional collaborations, and driving evidence-based policy development through gender-focused research. Implementing these recommendations can promote a more inclusive and equitable STEM environment, which is critical for sustainable development and innovation in Africa.

These are our recommendations;

1. Expand and Target Scholarship Programs for Women in STEM

While scholarship programs for women in STEM exist, their scope remains insufficient to tackle the entrenched gender gap. Governments, international organizations, and educational institutions should increase targeted funding for women in STEM.

However, beyond merely increasing the number of scholarships, these programs should also address intersectional barriers, ensuring access for women from marginalized or underrepresented communities (e.g., rural areas and minority ethnic groups).

Moreover, scholarships should complement mentorship programs and career guidance services to facilitate long-term retention and success in STEM careers. Rigorous evaluation of these programs should be embedded to assess their effectiveness and inform future adjustments.

2. Strengthen Gender-Responsive and Gender-Transformative Pedagogies

To promote a truly inclusive learning environment, educational institutions must shift from merely gender-responsive to gender-transformative pedagogies.

This involves training educators not only to recognize and mitigate gender biases in teaching but also to challenge existing gender norms within STEM fields.

Curricula should be designed to deconstruct patriarchal power dynamics and promote active female participation. Institutional policies must enforce these pedagogies across all levels of education, ensuring that gender sensitivity becomes an integral part of the academic culture.

Furthermore, continuous professional development for educators in gender equity should be mandatory, focusing on practical implementation and accountability.

3. Invest in Technological Infrastructure and Inclusive Innovation

Technological advancements are reshaping educational landscapes globally, and Africa cannot afford to lag, particularly in promoting STEM education for women. Investments in SMART classrooms, digital learning platforms, and virtual laboratories can enhance access to STEM education, especially for women in underserved areas. These investments must be accompanied by technology-driven pedagogies that support interactive and inclusive learning experiences. Furthermore, policies should ensure equitable access to these technologies, addressing the digital gender divide that often hinders women's participation in STEM. An emphasis on inclusive innovation ecosystems is critical, where women are actively involved in creating and utilizing technological advancements.

4. Promote Pan-African and Cross-Regional Collaborations

The gender gap in STEM is not confined to national borders; it is a continent-wide issue that requires a Pan-African response. Collaborative initiatives between universities, research institutes, and governments across African regions can facilitate sharing of best practices, resources, and knowledge. These partnerships should aim to scale successful gender inclusion strategies, such as integrating

STEM education with local economic development. Continental bodies like the African Union (AU) should play a pivotal role in creating frameworks for policy harmonization across countries, ensuring a unified approach to promoting gender equity in STEM. Collaborative platforms should also include private sector stakeholders to ensure alignment with industry demands and opportunities for women in STEM.

5. Support Gender-Focused Research and Evidence-Based Policy Development

A fundamental limitation in existing interventions is the lack of robust, gender-disaggregated data and research on women's barriers in STEM fields. Establishing gender-focused research centers within higher education institutions is essential for generating empirical evidence to inform policy interventions. These centers should engage in longitudinal studies that track women's STEM experiences from early education to career progression. Furthermore, research should focus on understanding the socio-cultural and economic dynamics that perpetuate gender inequality in STEM and evaluate the effectiveness of current programs. This evidence base will be critical for developing inclusive and adaptive policies that respond to the evolving challenges women face in STEM.

Conclusion

The workshops organized by APHRC, ADEA, and SARUA highlight the urgent need for targeted policies and interventions to promote gender inclusion in STEM across Africa. However, addressing gender inequality in STEM requires multi-level, systemic change that tackles the root causes of exclusion rather than surface-level interventions. By implementing the comprehensive recommendations outlined here, stakeholders can contribute to a more equitable and inclusive STEM landscape, ensuring that women and girls are empowered to participate fully in and contribute to Africa's scientific and technological advancements. These efforts are not only critical for gender equity but are also essential for unlocking the full potential of Africa's human capital in driving innovation and sustainable development.



Authors

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