

## **Debating New Approaches to Gender in Science and Technology Studies.**

*Taking the first steps toward inclusivity in STEM education in an African context.*

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‘This is not an easy course, and I am even shocked to see girls in my class’. These were not the first words I envisioned hearing during my first lecture in Statistical thermodynamics more than 25 years ago. As a consequence, 90 % of the girls and 10 % of the boys did not attend the next lecture. A single sentence changed the course of dozens of young aspiring scientists and probably pushed many out of STEM (Science Technology Engineering and Mathematics). According to UNESCO, 35% of STEM students in higher education globally are women with variations within specific STEM disciplines<sup>[1]</sup>. In many countries, girls are less likely than boys to pursue studies in STEM even when they perform well at secondary school level. They may face barriers to entry and advancement through discrimination and unconscious bias; partly due to cultural and societal factors that discourage them from pursuing careers in these areas. Ironically, boys are encouraged to pursue careers in science and engineering even when they may not be interested. The expectation that they are the dominant gender when there is little to support this dominance can lead to helplessness or violence. Gender/societal norms can drive negative masculinities and negative masculine narratives, which also hurt the boys. However, in some African cultures, boys are naturally expected to pursue careers that are traditionally associated with men, such as agriculture and construction, which can also limit their exposure to other STEM subjects.

Africa continues to lag in STEM capacity. This is largely attributed to a lack of basic and critical infrastructure as well as resources relevant to enhancing STEM education. This results in fewer African scientists on the global stage. Addressing these issues will require a multi-faceted approach that involves increasing access to education, promoting gender equality, providing more role models, improving teaching methods, addressing cultural barriers, and increasing investment in STEM education. Modern programmes that encourage new ways of knowledge production will go a long way in addressing gender bias in science and technology studies. The importance of role models and mentorship programmes in STEM cannot be overstated. Structured interactions between students and experienced scientists in industry, academia, and research centers will lead to increased interest in STEM as the reality of the application of their studies is experienced through hands-on activities. In resource-challenged settings, excitement in STEM can be created by holding out-of-class hands-on sessions where students can utilise readily available natural resources to explore the world of STEM. Educators should also take advantage of the improved internet connectivity in Africa to develop new approaches in teaching sciences to students who are often advanced in the digital space.

Often, discussions on gender parity in STEM take place in fora where the affected demographic is under-represented. While experienced scientists may offer insights into their journeys in the field of science, the involvement of students and educators in the dialogue can help improve the approach to teaching STEM as new challenges continue to emerge over time. The landscape in research and development is likely to take a positive turn in inclusivity as problems become more gender-focused. Encouraging young scientists to pursue research in traditionally overlooked areas will eventually lead to better innovation that addresses the needs of their own environment. By identifying values, success factors, and obstacles, educators can help students become aware of their abilities and potential and help overcome stereotypes.

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