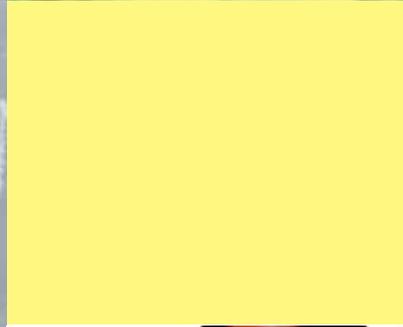
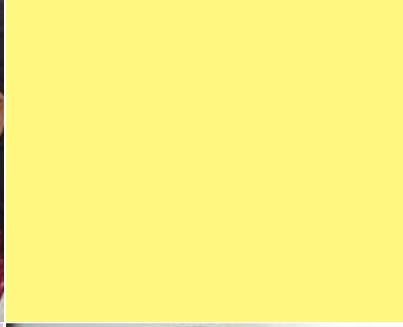
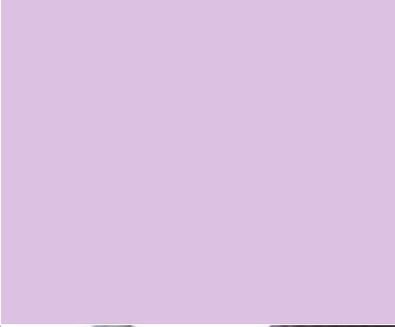
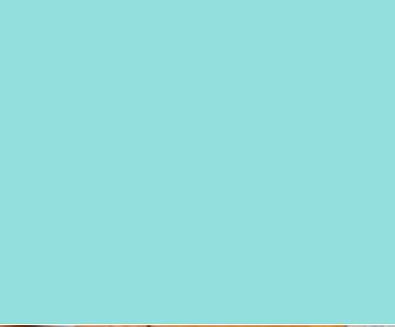




WHY SO FEW?

**WOMEN IN SCIENCE, TECHNOLOGY,
ENGINEERING AND MATHEMATICS (STEM)**



It is no secret that the fields of Science, Technology, Engineering and Mathematics (STEM) are predominantly male with historically low women's participation. The continued existence of gender disparity in STEM fields over the years has formed one of the major themes in social and academic investigation. Brian Mutebi and Owen Wagabaza explore some of the reasons behind the smaller numbers of women in STEM.

Barbara Birungi, the Director of Hive Colab and founder of Women in Technology Uganda, says the lack of mentorship in STEM fields is one of the reasons why women are still few in this field. According to Birungi, the support and encouragement of a mentor can make a lot of difference in women's decision to or not to pursue a career in STEM disciplines.

This is particularly important for young people who face many obstacles early on in their careers. "Since these young individuals often look to those who are more established in their discipline for help and guidance, the responsiveness and helpfulness of potential mentors is incredibly important," says Birungi.

The Queen Bee effect

The Queen Bee effect occurs when higher-status women, particularly in male-dominated professions, are far less likely to help other women than their male colleagues might be. Citing a 2004 study, Peter Emojong, a lecturer in Psychology at Makerere University, explains that individual mobility for a member of a negatively stereotyped group is often accompanied by a social and psychological distancing of oneself from the group.

This implies that successful women in traditionally male-dominated careers do not see their success as evidence that negative stereotypes about women's quantitative and analytical abilities are wrong, but rather as proof that they are exceptions to these stereotypes.

Emojong cites the example of Margaret Thatcher, the former British Premier, who had very few women in her cabinet. Such women, Emojong says, may actually play a role in perpetuating rather than abolishing these negative stereotypes.

Lack of interest

A 2007 meta-analysis of STEM concluded that men prefer working with things and women prefer working with people. When interests were classified by RIASEC type (Realistic, Investigative, Artistic, Social, Enterprising, Conventional), men showed stronger Realistic and Investigative interests, and women showed stronger Artistic, Social and Conventional interests. Sex differences favouring men were also found to be among the more specific measures of interest in engineering, science and mathematics.

In the study, *Untangling Life Goals and Occupational Stereotypes in Men's and Women's Career Interest*, published in 2015 by the Alabama STEM Education Research Team (ASERT), the major reason given by women for switching majors from STEM areas to non-STEM areas was that non-STEM academic majors offered better education options that better matched their interests. Others reported a loss of interest in the chosen STEM majors. Additionally, 38 per cent of female students who remained in STEM majors stated that there were other academic areas that might be a better fit for their interests.

Dr Anne Preston's (2004) survey of 1,688 individuals who had left the sciences also showed that 30 per cent of the women considered 'other fields [being] more interesting' as their reason for leaving. Dr Preston is a teaching fellow at the University College London. Her research findings in a paper entitled "Leaving Sciences" show that advanced science skills do not often result in a woman being interested in a STEM career.

Stereotypes

There are stereotypes where people associate science and maths fields with males, and humanities and arts fields with females. In addition, Dr Diana Atwine, the Permanent Secretary Ministry of Health, says that people often hold negative opinions of women in what is deemed masculine careers such as engineering. "People judge women to be less competent than men in 'male jobs' unless the women are clearly successful in their work. But even when they show competence in such jobs, some people do not appreciate their work," she sums it up.

There is also the issue of self-assessment, or how individuals view their own abilities. Research shows that girls rate their mathematical abilities lower than boys with similar mathematical achievements do; girls also believe that they have to be exceptional to succeed in 'male fields'. "As a result of this lower self-assessment in sciences even in the face of good grades and test scores, fewer girls than boys aspire to pursue STEM careers," Atwine explains.

The importance of gender equality in STEM

Ensuring that girls and women have equal access to education and, consequently to STEM careers; this is important from the human rights, scientific and development perspectives. "From a human rights perspective, all people are equal and should have equal opportunities, including studying and working in the field of their choice," says Atwine.

From a scientific perspective, the inclusion of women promotes scientific excellence and boosts the quality of STEM outcomes, as diverse perspectives aggregate



creativity, reduce potential biases and promote more robust knowledge and solutions.

From a development perspective, gender inequalities in STEM education and employment perpetuate existing gender inequalities in status and income. Gender equality in STEM will ensure that boys and girls, men and women are able to acquire skills and opportunities to contribute to and benefit equally from the benefits and assets associated with STEM.

Bridging the STEM gap for women

There is need to provide opportunities for mentorship and a sense of community. Dr Asher Cheptoris, a dental surgeon and founder of Sinai Dental Clinic, argues that women scientists as well as organisations can play a role in helping women in STEM overcome the academic and professional challenges unique to their gender. “Mentorship helps women recognise institutional biases or the unacknowledged gender biases in themselves or other factors that might be preventing career advancement, forcing them to feel they don’t belong, or inadvertently pushing them out of STEM,” she explains.

There is need for the academic leadership to confront institutional biases that persist against women in STEM. “Anyone in an academic role that can influence a student’s decision to stay in or leave STEM should have a professional obligation to understand their students’ concerns,” Cheptoris notes.

Emojong says there is need to introduce problem-solving learning that helps attract and retain women, in particular, by meaningfully connecting them to the societal relevance of their field. “The sooner the exposure to STEM projects that are linked to societal improvements, the better,” advises Emojong.