Gender diversity in STEM education

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In both academic and private-sector, the diversity of research teams ensures that new perspectives and ideas are brought to the table. One of the key aspects of diversity is gender. The unique perspectives and contributions of women to scientific research teams have been recognized globally. Science, technology, engineering, and mathematics (STEM) are central to development agendas globally (1, 2). Increasing the participation of women in STEM fields to drive innovation and achieve excellence in research is a stated goal of the United Nations Educational, Scientific and Cultural Organization (UNESCO) (1). These efforts call by the United Nations Development Program (UNDP) to achieve gender equality and empower women and girls worldwide. The UN Sustainable Development Goal (SDG) 4 aims to ensure inclusive and equitable quality education and lifelong learning. SDG 5 seeks development and implementation of policies that will ensure women are able to achieve effective participation in the workforce and have equal opportunities for leadership (3).

What is the state of STEM education for women?

Despite the remarkable gains that women have made in education and the workforce over the past decades, progress has been uneven. Women

continue to be under-represented in STEM fields, particularly at the graduate level (4). UNESCO reported that 28% of world researchers are women (5). Though nearly equal numbers of men and women pursue bachelor's and master's degrees in the STEM fields, the loss of women from the research career path begins at the PhD stage and continues through the highest organizational levels, a phenomenon described as a "leaky pipeline" (5).

The representation of women in STEM varies geographically, certain countries have relatively high proportions of women among researchers (Bolivia 63%, Venezuela 56%), while others have lower proportions (France 25%, Republic of Korea 18%, Japan 15%) (1, 5). On the other hand, women's enrollment in engineering and the sciences does not automatically lead to higher female labor force participation or lower female unemployment. For example, Iran ranks 5th with most graduate in STEM after Russia and 70% of university graduates in STEM are women (6, 7). Despite the high percentage of women in engineering and science, the female labor force participation rate is low in comparison with developed countries (e.g., France; 8).

Factors underlying gender disparities in STEM

A number of factors are influencing the low participation of girls and women in STEM. These include sociocultural and labour market preconceptions which greatly affect career choices and perspectives among young people, especially with regard to which professions are perceived as well-suited for women or men. Education has a significant impact, particularly in terms of gender-sensitive policies and frameworks, teacher training and recruitment, as well as ensuring that learning materials are free of gender stereotypes (9).

Strategies to reduce gender disparity in STEM education

There is no single factor that can influence alone women's participa-

tion in STEM education. Positive outcomes are the result of interactions among factors at the individual, family, school and societal levels, and demand engagement from stakeholders at each of these levels. Getting more women into STEM will therefore require a partnership among parents, educational institutions, government, industry, and organizations. This requires political will and investments to pursue girls' interest in STEM. Internationally comparable data are also needed on a larger scale to ensure evidence-informed planning and policymaking (10).

In closing, to improve countries' capacity in STEM and to achieve the SDGs of the United Nations, gender diversity and equality in science need to be prioritized and actively addressed through policies and programs.

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