The gender gap in STEM

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Why is in news? International Women's Day 2023 (IWD) will be commemorated on March 8 under the theme "DigitALL: Innovation and technology for gender equality". Science, Technology, Engineering and Mathematics – collectively termed the STEM fields – continue to be dominated by men.

About the 'gender gap' in STEM

Globally, 18 per cent of girls in higher-level education are pursuing STEM studies, compared with 35 per cent of boys.

Even within the STEM fields, there lies a gender divide, with similar numbers of boys and girls pursuing natural sciences while far more boys looked to engineering, manufacturing and construction.

In India, the enrolment of girls in engineering programmes is significantly lower when compared to their male counterparts.

Overall in UG, PG, MPhil and PhD engineering programmes, the total enrolment is 36, 86,291 where 71 per cent of enrolled students were males and 29 per cent were females, according to data from the All India Survey of Higher Education for 2020-2021.

But of all students enrolled in science courses at undergraduate, post-graduate, MPhil and PhD levels, women at 53 per cent of enrolment outnumbered men and some increases have been witnessed of late.

These gains, though, don't necessarily mean there will also be an increase in employment, because of multiple factors.

Reason for Gender Gap

Multiple factors determine how women choose to work and the options available to them.

These include the presence of existing resources such as mentors and programmes offering scholarships, as well as, on a broader level, general societal attitudes on women's education that do not encourage families to invest in it as much as they do for boys.

UNICEF points to gender bias in curricula. For instance, in India, more than 50 per cent of illustrations in math and science textbooks in primary show boys and only 6 per cent show illustrations of girls.

In the UK, over a quarter of girls say they have been put off a career in tech as it is too male-dominated and only 22 per cent can name a famous female working in the field.

In the US, 26 per cent of tech startups have at least one female founder, and in Europe, only 21 per cent of tech founders are female. But it points out that numbers are increasing — potentially creating more role models for girls and women.

Cultural stereotypes are also used to control women's choices and justify restrictions. For instance, textbooks and picture charts showing scientists as a man and a nurse or a teacher as a woman instills ideas about who she can or can't be at a very young age.

Many women drop out of a STEM career midway or quit completely which is called the 'leaky pipeline'. This could be related to various factors including, but not restricted to, the wage gap, lack of mentoring, gendered households, glass ceiling, and workplace harassment.

Concerns over the Gender Gap

Across the world, there has been a marked absence of women in the professional realm of STEM subjects – including the IT sector, environment and climate, medical sciences, etc.

This underrepresentation is of note because developments in STEM fields, particularly in technology, are increasingly shaping all aspects of modern life – from chatbots like ChatGPT that are expected to replace workers in various settings to the ubiquity of social media which shapes identities and public discourse.

Furthermore, from a career perspective, these fields are generally lucrative for workers. A typical STEM worker earns two-thirds more than those employed in other fields, according to Pew Research Center.

Therefore, the underrepresentation of women in STEM impacts the overall gender pay gap as well – women are typically overrepresented in lower-paying jobs and underrepresented in higher-paying jobs such as in STEM fields.

Government measures

Government's steps to encourage women in STEM fields include implementation of women exclusive schemes like 'Knowledge Involvement Research Advancement through Nurturing (KIRAN)', 'Consolidation of University Research through Innovation and Excellence in Women Universities (CURIE)' of DST, 'Biotechnology Career Advancement and Re-orientation Programme (BioCARe)' of Department of Biotechnology (DBT), National Award for Women Scientist of Ministry of Earth Sciences, Women Excellence Award of SERB etc.

In 2016-17, 'Mobility' component has been introduced under KIRAN to address relocation issue of working Women Scientists.

In 2017-18, DST launched a programme 'Indo-US Fellowship for Women in STEMM' (Science, Technology, Engineering, Mathematics & Medicine) to provide opportunities to Indian Women Scientists, Engineers & Technologists to undertake international collaborative research in premier institutions in USA for durations of 3-6 months.

During 2019-20, a new scheme "Vigyan Jyoti" for girl students of Class 9 to 12 in order to increase the number of women in STEM education has been implemented. Under the scheme, age relaxation of 5 years is given to young women scientists for participating in SYST and other R&D schemes.

These women specific programmes and other measures help in improving the participation of women in R&D in the country.

The Way forward

The way forward, the solutions, to take down the gender barriers are still more on paper, less in action. More so because it involves actively listening to those who have been excluded, marginalised, and harassed. It urges action that requires unlearning, re-learning, and making space.

First, persistent gender sensitisation, an inclusive school curriculum that is supportive of students with disabilities, and equal access to quality education, is crucial

Second, visibility is important to counter the deep-rooted idea that STEM is a man’s job

Third, mental health support and a sense of community in schools and universities can be vital in reducing the dropout rates.

Four, there needs to be more flexibility at work. If anything, the pandemic has taught us we can all work from home. Workplaces should implement on-site childcare policy, and strong anti-discriminatory and anti-harassment laws.

And finally, it’s time to put pressure on people to take accountability