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WOMEN in STEM

Challenges and Opportunities in India

WOMEN & THE FUTURE OF WORK

POLICY BRIEF 3 in the 'Women and the future of work' series

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CONTENTS

Acknowledgements

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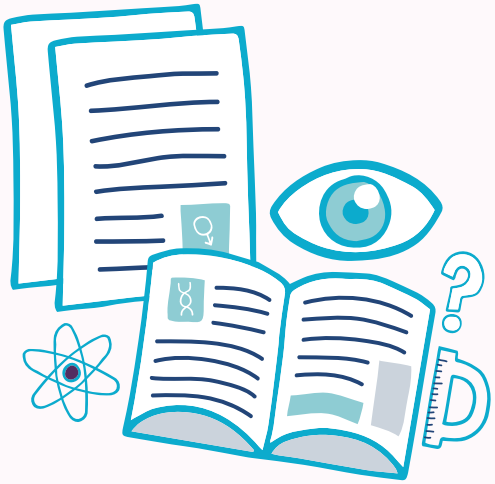
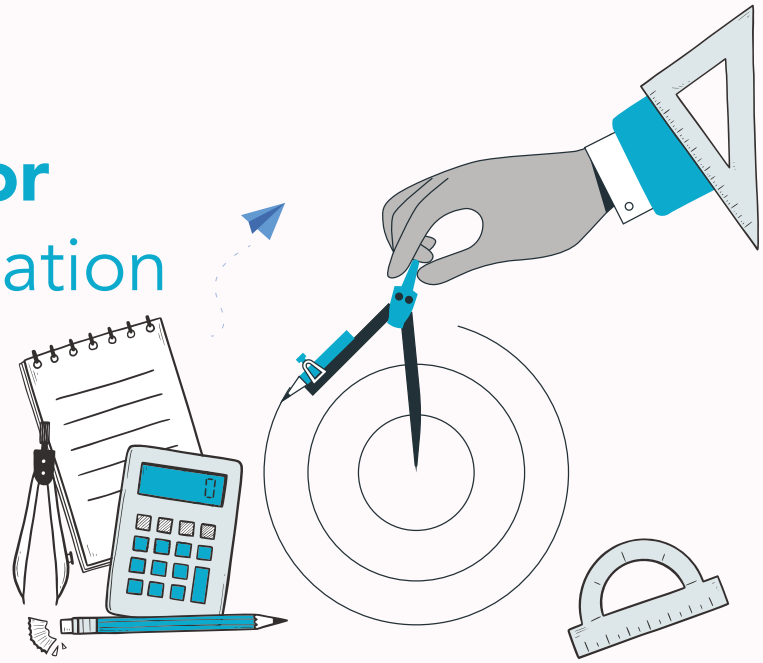
About the series



'Work' — as we know it — is shifting. Increasingly, there are a host of factors that are changing the landscape of employment, from skilling outcomes and sector-specific job creation to fertility rates and family sizes. Estimates from McKinsey & Co. suggest that globally, between 40 million and 160 million women may need to transition between occupations by 2030, into higher-skilled roles. Further, it is predicted that nearly 12 million Indian women could be staring at job losses owing to automation. Against this backdrop, what might work to keep women in India's workforce as we face down an increasingly contentious future of work? Using secondary research, and interviews with stakeholders, the briefs in this series highlight gender responsive principles for different thematic areas that can enable and harness women's workforce participation.

BACKGROUND
Making a Case for Women's Participation in STEM

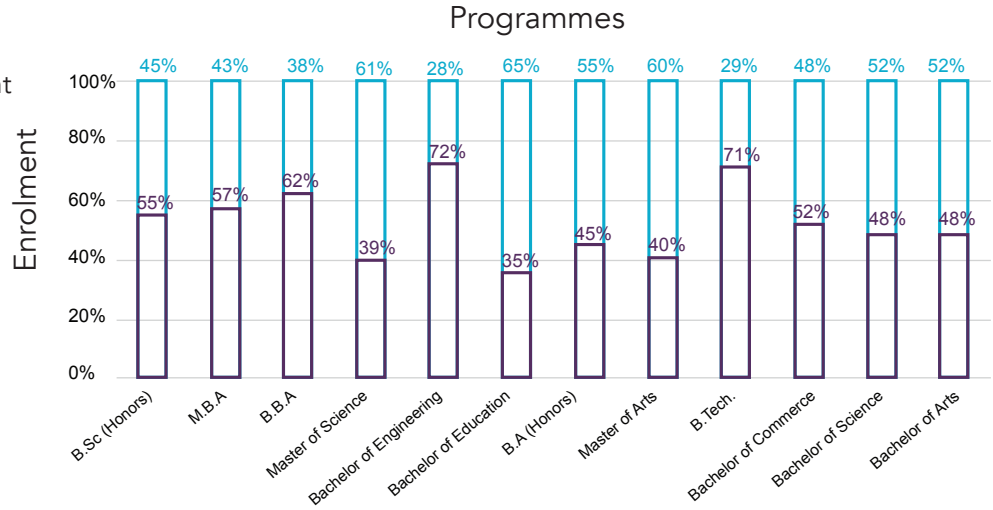


According to a UNESCO report, only 35 per cent of students in higher education worldwide are women.[1] Their low participation in science, technology, engineering, and math (STEM) is a global problem, with women constituting less than 30 per cent of the world's STEM researchers.[2] In 2019, the number of women faculty in STEM in India was about 14 per cent.[3] A recent study by Shruti Muralidhar and Vaishnavi Ananthanarayanan (2023) across 100 Indian universities found that only 16.6 per cent of the overall STEM faculty were women.[4] A 2018 World Bank report indicates that more than 40 per cent of the total graduates in STEM in India are women.[5] Similar findings were reported by the latest All India Survey on Higher Education (AISHE) (2020-21) as well. Women make up 42.3 per cent of the sample in STEM education-including undergraduate, postgraduate, MPhil, and PhD courses.

This trend, however, must be understood with caution. Within this sample, girls are concentrated in life sciences while their presence is much lower in engineering. The B.Tech programmes, for example, consist of only 28.7 per cent women. Similarly, women's proportion decreases as one moves up the ladder. As per the most recent data available, women make up only 9 per cent of fellows in the three Indian science academies The Indian National Science Academy (INSA), The Indian Academy of Sciences (IAS), and The National Academy of Sciences (NASI).[6]

Figure1

Programme-wise enrolment of female students, AISHE 2020-21



[1] https://www.indiatoday.in/education-today/featurephilia/story/why-stem-education-is-essential-in-a-growing-economy-like-india-1702214-2020-07-19
[2] https://www.weforum.org/agenda/2020/02/stem-gender-inequality-researchers-bias/
[3] https://www.indiatoday.in/education-today/news/story/smriti-irani-inaugurates-women-science-congress-with-inspiring-speech-html-1424127-2019-01-05
[4] https://www.biorxiv.org/content/10.1101/2023.10.26.564078v1.full.pdf
[5] https://genderdata.worldbank.org/indicators/se-ter-grad-fe-zs/?fieldOfStudy=Science%2C%20Technology%2C%20Engineering%20and%20Mathematics%20%28STEM%29&view=bar
[6] https://unesdoc.unesco.org/ark:/48223/pf0000380700/PDF/380700eng.pdf.multi

Relevance of STEM Education and Employment

Given that the labour market is constantly changing and evolving, especially due to automation and Artificial Intelligence (AI), STEM education enables women to keep up with this transformation by giving them transferable skills.[7] Increasing women's participation in STEM could potentially close the gender pay gap- by boosting women's cumulative earnings by USD 299 billion by 2027.[8] In India, since the COVID-19 pandemic began in 2020, the prominence of STEM and technology occupations has considerably expanded, growing by approximately 37 per cent and 38 per cent, respectively.[9] Research suggests that women in India who take up science are more likely to be employed and earn about 28 per cent more than women who study non-technical subjects.[10] Beyond employment opportunities, STEM education is also becoming increasingly important from a human development perspective. Skills such as logical reasoning, promoted within experiential learning pedagogies, enable children to become adults with a broader range of skills, and with the ability to solve complex real-life problems.[11]

Further, STEM education is argued to be a critical component for addressing pertinent policy problems (such as the climate crisis). Women's participation in formulating policies and interventions using their STEM and problem-solving skills can help make the response to such crises more gender-responsive.[12] Globally, ensuring gender equality in STEM can help create a more balanced environment that could contribute to closing the skills gap between males and females, enhance the employment rate of women, and reduce occupational segregation. Furthermore, women's empowerment in STEM has the potential to disrupt the cycle of poverty in marginalised communities, where girls frequently lack access to the same opportunities as boys.[13]

[7] https://www.unicef.org/media/64751/file/Global-framework-on-transferable-skills-2019.pdf
[8] https://www.cfr.org/blog/girls-stem-education-can-drive-economic-growth
[9] http://bwpeople.businessworld.in/article/Tech-And-STEM-Jobs-Continue-To-Increase-Bangalore-leads-In-The-Race-Indeed/26-04-2022-426657/
[10] https://drive.google.com/file/d/1eNVhLZIamSpZ8vPp9LSFZh0ZbF30tZxB/view
[11] https://www.indiatoday.in/education-today/featurephilia/story/how-can-stem-education-impacts-a-childs-growth-how-is-it-different-from-other-study-modules-2321013-2023-01-13
[12] https://www.bbc.com/storyworks/future/the-next-wave-empowering-global-change/women-in-stem
[13] https://unesdoc.unesco.org/ark:/48223/pf0000235406.locale=e n

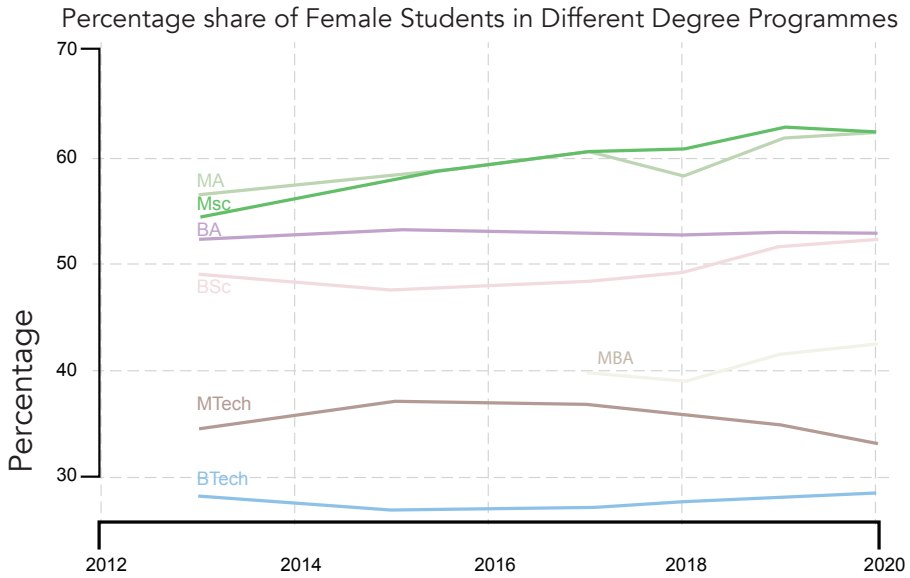
Current Scenario: What Does the Data Say?

The AISHE Reports[14] suggest that women's enrolment in education increased from 18.8 million in 2019-20 to 20.1 million in 2020-21. Women form 43.2 per cent of the sample across undergraduate, postgraduate, M.Phil. and PhD courses. The graph below (Figure 2) highlights women across different disciplines from 2012 to 2020. This indicates that at the undergraduate level, female representation is approximately 50 per cent in Bachelors of Arts and Sciences. However, female representation is particularly low for Bachelors of Technology (B.Tech) and Masters of Technology (M.Tech).

The Bachelor of Engineering (B.E.) course, similarly as per AISHE (2020-21) has 13 lakh students enrolled, of which, only 28.5 per cent are female.[15]

Figure 2

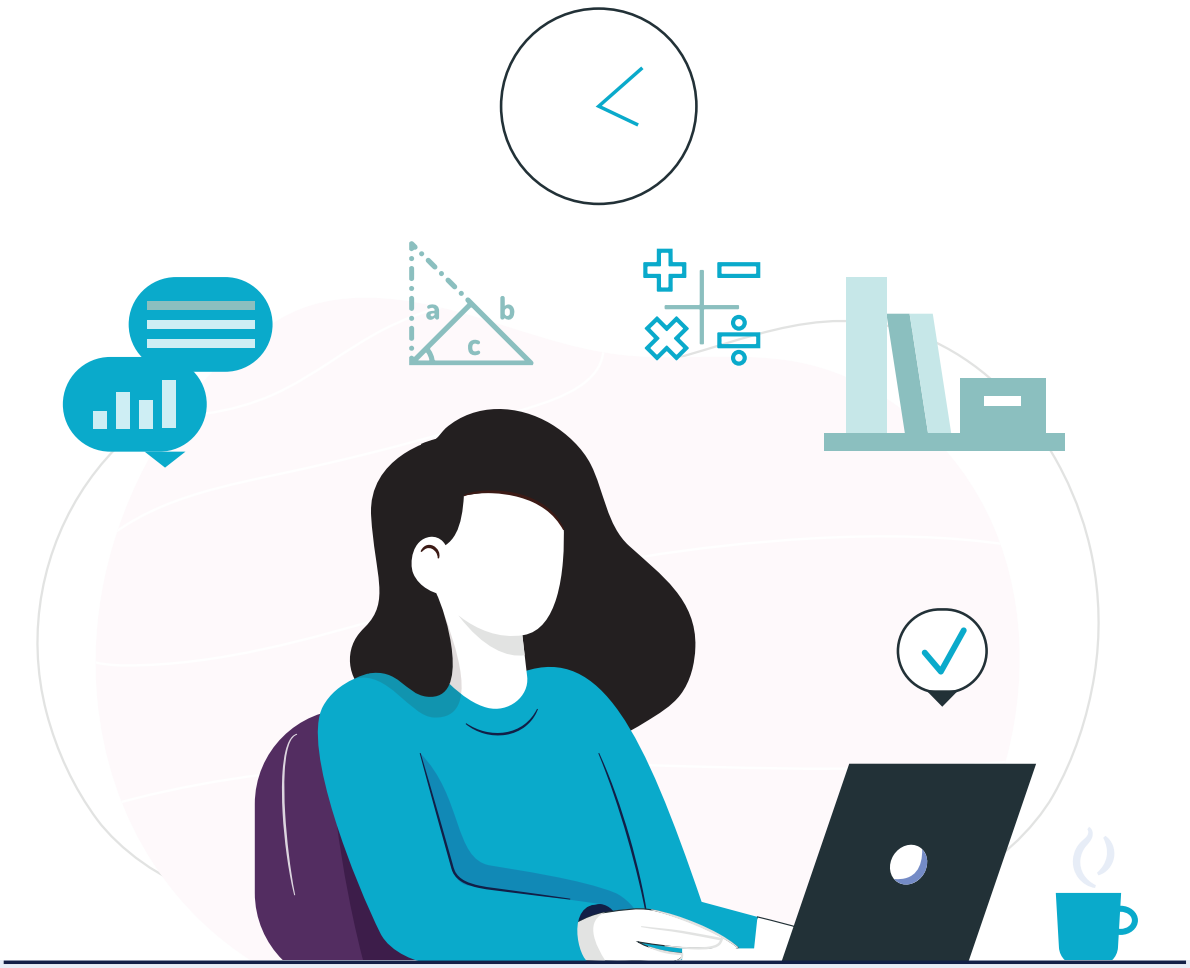
Representation of women's participation in different education disciplines from 2012-20.[16]



[14] https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/AISHE_Report_2020_21.pdf
[15] https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/AISHE_Report_2020_21.pdf
[16] This data were shared by Dr. Nandana Sengupta from the Indian Institute-Delhi, at an event hosted by IWWAGE, https://iwwage.org/women-in-stem-in-india/

Subject and career choices in India are often influenced by multiple socio-cultural factors. As a result, women's enrolment in some prestigious science subjects, such as chemistry (42 per cent), physics (38 per cent) and engineering (32 per cent), remains relatively low. AISHE 2020-21 shows that at the undergraduate level, there are only 6.68 per cent female students in mechanical engineering and 23 per cent in civil engineering.[17] In engineering, across undergraduate, postgraduate and PhD levels, participation of female students is very low in streams such as civil, electrical and mechanical engineering, with mechanical engineering having less than 10 per cent female students across all levels.[18] However, other fields, such as life sciences (56 per cent), microbiology (67 per cent), and information technology/computer sciences (54 per cent), witness higher enrolment of women, as per Ministry of Education (2020)[19] data. Even within STEM fields, therefore, women's participation is skewed towards certain fields.

In terms of employment, a UNESCO report (2022) indicates that the presence of female principal investigators in Research and Development (R&D) projects is abysmal; in 2000, 13 per cent of the sample were women. In 2017, the number had only moved up to 24 per cent.[20]



[17] https://aishe.gov.in/aishe/BlankDCF/AISHE%20Final%20Report%202020-21.pdf
[18] As shared by Dr. Nandana Sengupta, IIT Delhi, at an IWWAGE Seminar, 2023.
[19] https://unesdoc.unesco.org/ark:/48223/pf0000380700/PDF/380700eng.pdf.multi
[20] https://unesdoc.unesco.org/ark:/48223/pf0000380700/PDF/380700eng.pdf.multi, page 43.

What Limits
Women's Participation in STEM?

Women's limited participation in STEM is a global issue.[21] Trends in the STEM sector can be understood using a lifecycle approach, with different stages. The "leaky pipeline" metaphor illustrates the gradual attrition of women and individuals from minority groups within STEM fields as they progress through each level. The stages are broadly characterised as entry, experience, retention and leadership:

1. Factors Affecting Entry

a. **Perception of STEM and Socialisation in Schools:** STEM education is perceived to be a masculine pursuit.[22] Narratives around girls' femininity also shape women's motivation to be involved in different fields and lead to their aversion to science-and maths-related opportunities.[23] Insufficiently-trained school educators, who are important socialising agents, exacerbate and perpetuate gender stereotypes.[24]

b. **Social Norms for Women:** Social norms pertaining to early matrimony, mobility restrictions during puberty, and household responsibilities steer women away from STEM.[25] Coaching centres for competitive exams, and even schools and colleges, are located at a distance. Due to inadequate public mobility infrastructure and a perceived lack of safety, women often let go of desirable opportunities.[26]

c. **Gaps in the Education Ecosystem:** The Indian education system has gaps that restrict more women from entering and navigating the STEM ecosystem. For instance, the discourse on gender-equality in a patriarchal ecosystem has not been mainstreamed yet and has not moved into the school curricula.[27] Moreover, prevailing shortcomings in foundational literacy and numeracy, and insufficient resources and opportunities do not allow children to cultivate a STEM-oriented mindset.[28]

d. **STEM Education is Expensive:** STEM education also becomes inaccessible to women due to the nature of financial investment it requires. Coaching institutes are often expensive and are not seen as "worthwhile" investments by most households.

[21] https://www.catalyst.org/research/women-in-science-technology-engineering-and-mathematics-stem/
[22] https://www.frontiersin.org/articles/10.3389/feduc.2019.00060/full
[23] https://pubmed.ncbi.nlm.nih.gov/24298199/
[24] https://www.frontiersin.org/articles/10.3389/feduc.2020.00136/full
[25] https://files.eric.ed.gov/fulltext/EJ1099426.pdf
[26] https://documents1.worldbank.org/curated/en/723631626710146405/pdf/Safety-First-Perceived-Risk-of-Street-Harassment-and-Educational-Choices-of-Women.pdf
[27] https://www.brookings.edu/articles/to-empower-girls-in-india-make-gender-education-compulsory/
[28] https://files.eric.ed.gov/fulltext/ED574401.pdf

2. Factors Affecting Experience

a. Socialisation and Isolation in STEM: Many young women describe STEM as a "boys' club". This isolating work environment[29] with few socialisation opportunities translates into women often undervaluing their own capabilities to excel. To imagine a long-term career in STEM, confidence in one's own abilities is critical[30]; its absence results in women having lower self-efficacy than men in STEM.[31]

b. Academic Housekeeping: Employment within STEM fields continues to maintain and replicate the traditional gender roles of society.[32] Men in positions of power often delegate responsibilities of 'academic housekeeping' to women such as serving on committees and managing administrative chores.[33]

c. Perception of Affirmative Action: Affirmative action in STEM education has the potential to increase the participation of marginalised groups.[34] However, without stakeholder sensitisation, this could result in discrimination.[35] Research argues that affirmative action policies in the absence of acknowledgement of structural issues could do more harm than good.[36]

d. Hiring Biases Due to Reproductive Role of Women: The age at which women are expected to be most productive at work is also the age for family planning. This leads to discriminatory hiring practices. Further, in India, there are age-restricted grants/fellowships which affect women's capacity to apply for jobs because they also have more care-related responsibilities in their late 20s and early 30s.[37,38]

3. Factors Affecting Retention

a. Inflexible Workplaces: The structure of the workplaces, in terms of working hours, conditions, flexibility, infrastructure, provisions for childcare, etc., act as major barriers.[39,40] Enforcement of gender-blind policies at the workplace has exacerbated women's difficulties. Lack of supportive childcare policies leads to women dropping out and not being able to return to the workplace. As per the Key Global Workforce Insights report data, 50 per cent of women sampled from India reported that they faced a rigid, protocol-driven lab culture.[42]

b. Pay Disparity: Key Global Workforce Insights[43] report also notes that about 81 per cent of Indian women in STEM have felt a gender bias in performance evaluation, and most women felt it did not allow them to reach top positions.[44] Globally, women earn 15-30 per cent less than their male counterparts and the gender-based pay gap occurs right from the start in STEM.[45] This pay gap has less to do with skill sets and more with men's belief in their ability which helped them bargain better starting salaries as argued by a study at Stanford University.[46]

c. Dual Burden on Women: The dual burden[48] of household responsibilities and workplace commitments remains the most prominent roadblock to career progression.[49] Access to domestic staff helps middle-class women cushion this burden; but even then, their return to the workforce is limited, as managing the staff is also seen as their responsibility.[50]

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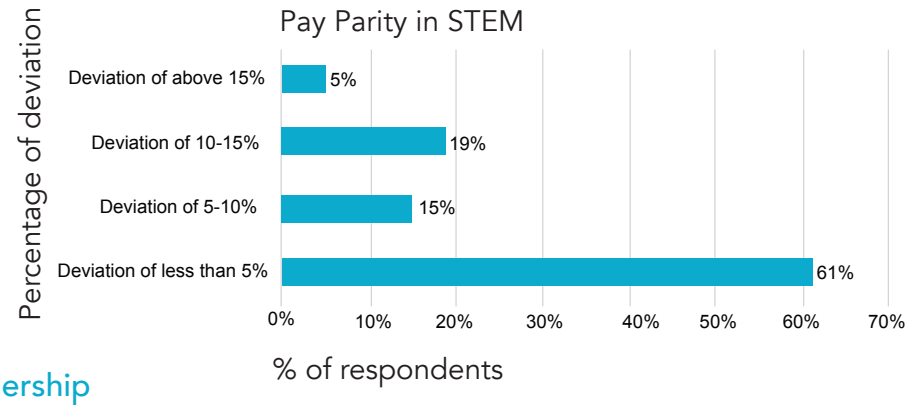
[29] https://journals.sagepub.com/doi/10.1177/00027642221078518?icid=int.sj-full-text.citing-articles.3
[30] [PDF] rice.edu
[31] https://drive.google.com/file/d/1eNVhLZIamSpZ8vPp9LSFZh0ZbF30tZxB/view
[32] https://itidjournal.org/index.php/itid/article/view/203.html
[33] https://www.svet.lu.se/en/article/academic-housekeeping
[34] https://www.deccanherald.com/india/affirmative-action-can-help-women-in-stem-beyond-the-entry-level-iisc-director-1194996.html
[35] https://www.epw.in/engage/article/Survey-at-an-IIT-Campus-Shows-How-Caste-Affects-Students-Perceptions
[36] https://www.researchgate.net/publication/347504807_For_a_Place_at_the_%27High-Table%27_The_Compelling_Case_of_Indian_Women_in_Science
[37] https://journals.sagepub.com/doi/10.1177/00027642221078518?icid=int.sj-full-text.citing-articles.3
[38] https://www.deccanherald.com/india/scientific-breakthroughs-systemic-barriers-women-in-stem-1195102.html
[39] Beyond family and societal attitudes to retain women in...Current Science · https://www.currentscience.ac.in › …
[40] https://www.currentscience.ac.in/Volumes/100/01/0043.pdf
[41] https://www.kellyservices.com.sg/media/kelly-services-sg/client/women_in_stem.pdf
[42] https://www.kellyservices.com.sg/media/kelly-services-sg/client/women_in_stem.pdf
[43] https://www.kellyservices.com.sg/media/kelly-services-sg/client/women_in_stem.pdf
[44] https://www.orfonline.org/expert-speak/stem-and-the-digital-economy-for-women/
[45] https://www.kellyservices.com.sg/media/kelly-services-sg/client/women_in_stem.pdf
[46] https://www.gsb.stanford.edu/insights/whats-behind-pay-gap-stem-jobs
[47] Bridging the skills gap, NLB Services and NTT Data, 2023
[48] https://www.researchgate.net/publication/367252855_Kaur_and_Kapoor_Securing_the_leak_shattering_the_glass_ceiling_in_Seminar_Issue_on_Women_In_Science_Dec_2022
[49] https://livewire.thewire.in/gender-and-sexuality/work-from-or-work-for-home-dual-burden-on-women-during-the-pandemic/
[50] https://journals.sagepub.com/doi/10.1177/00027642221078518?icid=int.sj-abstract.citing-articles.77

Figure 3

Pay parity in India in STEM.[47]



4. Factors Affecting Leadership

a. Lack of Role Models: A lack of female leadership at traditional workplaces[51] means fewer aspirational role models for women[52], leaving all women to forge their own path with less than adequate guidance.

b. Inadequate Networking and Sponsorship Opportunities: Women are frequently isolated and excluded from informal networks, peer groups and support systems in STEM workplaces. The Inability to access this network results in inability to navigate institutions to climb up leadership positions. Similarly, they face a lack of sponsorship initiatives where a sponsor can effectively navigate complex corporate ecosystems and play a pivotal role in advocating for female employees.[53]

c. Presence of a Glass Ceiling: The presence of subtle and "invisible" sexist behaviour creates additional challenges for women in the workplace. Encouragingly, issues such as salary gaps and overt gender discrimination in India are becoming less obvious[54] but deep-seated social norms and biases continue to hinder progress for women, especially in leadership roles.[55]

Programmes and Schemes at National and International Levels

Programmes at the National Level: Mapped by Lifecycle Approach

Sl. No.	Name of the Programme	Implementing Body	Goal	Impact
1	Vigyan Joti	Ministry of Science & Technology (in partnership with Navodaya Vidyalaya Samiti, a separate MHRD agency)	Includes a variety of activities such as scientific camps, special lectures and seminars, counselling for students and parents, interactions with role models, tinkering activities, and visits to knowledge partners/research labs/industries/NGOs. To increase diversity in STEM, NVS has a network of JNVs in more than 600 districts across India	• Currently, 100 JNVs are serving as "Vigyan Jyoti Knowledge Centres" for girls from JNVs, KVs, government schools, and army schools in small cities and rural regions.[56] • Assisted almost 1,820 tribal girls.[57] • According to DST's report (2021-22), almost 30,000 girls from 200 districts received benefits like parent-student counselling, subject-focused classes, curriculum-based STEM activities, exposure visits, etc.[58]

[51] https://www.mckinsey.com/featured-insights/diversity-and-inclusion/women-in-the-workplace
[52] https://www.frontiersin.org/articles/10.3389/fpsyg.2020.02204/full
[53] https://techcrunch.com/2020/03/13/sponsors-could-be-key-to-solving-techs-lack-of-gender-diversity/
[54] https://www.tandfonline.com/doi/abs/10.1080/12259276.2018.1496616
[55] https://www.jstor.org/stable/4419259
[56] https://vigyanjyoti.com
[57] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1796965
[58] https://dst.gov.in/sites/default/files/Major%20Success%20Stories%20of%20DST%20in%202022.pdf

2	Supernumerary Scheme at IITs	IITs	Additional seats set up for women to allow existing social obstacles to be broken from the ground up	• Target of at least 20% female students met by most IITs • In 2013-17, there were approximately 5% female students across zonal IITs (Delhi, Bombay, Madras, etc.); after introduction of supernumerary, this number rose with Madras being the best performing IIT, with about 20-30% of females across 2018-22.
3	CURIE: Consolidation of University Research for Innovation and Excellence in Women Universities	Department of Science and Technology	Develop top-tier female scientists across all sectors of basic sciences and technology who will eventually conduct cutting-edge research in their respective fields	• DST financed nine women's universities across the nation, including: Avinashilingam University for Women, Coimbatore; Banasthali Vidyapith, Banasthali; Sri Padmavati Mahila Visvavidyalyam, Tirupati; SNDT Women's University, Mumbai; Mother Teresa Women's University, Kodaikanal; Karnataka State Akkamahdevi Women's University, Vijayapura; Indira Gandhi Delhi Technical University for Women, Delhi; Rama Devi Women's University, Bhubaneswar; Bhagat Phool Singh Mahila Vishwavidyalaya, Sonipat[59] • Launched in 2008-09, CURIE contributed INR 40 crore to women's universities; CURIE-AI facility initiative (2019) contributed INR 4.20 crore[60]

[59] https://dst.gov.in/scientific-programmes/scientific-engineering-research/women-scientists-programs
[60] https://dst.gov.in/pressrelease/curie-initiative-dst-enhancing-research-facilities-women-universities

Programmes Promoting Employment

1	SERB POWER : (Promoting Opportunities for Women in Exploratory Research)	Science and Engineering Research Board (SERB): Department of Science and Technology (DST)	Reduce gender disparity in science and engineering research through women-focused fellowships and research grants	NA
2	GATI: Gender Advancement for Transforming Institutions	Department of Science and Technology	Promote gender-sensitive policies in STEM education by enhancing institutions' capacities through mentoring and support to create a transformative ecosystem. It considers women's STEM careers across their life cycle within the organisation and includes sensitisation, awareness raising, training materials, hand-holding support, and action plans to establish gender equality practices at the institutional level	NA
3	KIRAN: Knowledge Involvement in Research Advancement for Nurturing	Department of Science and Technology	Bring gender parity in S&T by inducting more woman talent in R&D through various programmes	• Provided financial support to 110 women scientists from 24 states/UTs participating in the "Women Scientist Scheme", with Maharashtra having the highest number of women (24)[61]
4	Women Scientist Scheme	Department of Science and Technology	Provide opportunities to female scientists and technologists (27- 57 years) who had taken a professional hiatus but wished to rejoin the workforce. Three categories of fellowships are available: WOS-A: research in basic/applied science; WOS-B: S&T interventions for societal benefit; WOS-C: Internship in IPRs for the self-employment	As per DST's Report (2021-22), under WOS-A, research support was made available to about 370 women scientists; 99 female scientists received training in IPRs[62]

[61] https://pib.gov.in/Pressreleaseshare.aspx?PRID=1796962
[62] https://dst.gov.in/sites/default/files/Major%20Success%20Stories%20of%20DST%20in%202022.pdf

5	Mobility Scheme	Department of Science and Technology	Addresses relocation challenges for women scientists in government organisations by providing an opportunity to women facing difficulties such as marriage, spouse transfers, caregiving, or children's education in different cities. It serves as a bridge, enabling them to continue research while exploring alternative career options in new locations, providing a supportive environment during the early stages of their careers with a contractual research award for independent research	NA

Best Practices from Other Countries

Programmes Promoting Education			
1	Nationaal Techniekpact 2020 (National Technical Pact), Netherlands[63]	Govt. of Netherlands	Aims to improve the flow of students to STEM jobs by focusing on 'talent development' and 'career guidance'. Part of the strategy is the Action Plan for Gender Focus in TVET to increase the number of female STEM-related Technical and Vocational Education and Training students that transfer to the labour market
2	Athena SWAN Charter	UK	Serves as a framework to promote gender equality within HE and research and address broader gender equality concerns. Members of Advance higher education have the opportunity to seek both institutional and departmental Athena Swan awards[64]
3	AGCCI: African Girls Can Code Initiative[65]	UN Women, International Telecommunication Union, and African Union Commission	Aims to give girls and young women in Africa access to digital literacy training. AGCCI is a four-year initiative to empower girls and young women (17-20 years) to work as computer programmers, designers, and creators and encourage more girls and young women to pursue education and professions in ICT
4	GirlTech[66]	UNICEF	Through Human-Centred Design workshops, help girls develop app models that cater to their needs, considering digital challenges such as phone sharing and connectivity limitations

[63] https://www.techniekpact.nl/thema/instroom
[64] https://www.advance-he.ac.uk/equality-charters/athena-swan-charter
[65] https://africa.unwomen.org/en/where-we-are/eastern-and-southern-africa/liaison-office-to-au-and-uneca/african-girls-can-code-initiative-agcci
[66] https://www.unicef.org/media/84046/file/Reimagining-girls-education-through-stem-2020.pdf

Programmes Promoting Employment

1	Balancing the Scale[67]	National Science Foundation, USA	Instituted in 2012, this approach helps attract, retain, and advance graduate students, postdoctoral researchers, and other researchers in STEM fields to help reduce drop-out rates of early-career researchers
2	FEMTECH	Govt. of Germany	FEMTECH's Career-Building Programme qualifies STEM talents already at school and offers career perspectives to female students, complemented by career advice for professionals and personal advice for high potentials. These women, well-known technology companies as well as leading scientific institutions and technical universities together form the successful FEMTECH network
3	MCC: Male Champions of Change	Govt. of Australia	FEMTECH's Career-Building Programme qualifies STEM talents already at school and offers career perspectives to female students, complemented by career advice for professionals and personal advice for high potentials. These women, well-known technology companies as well as leading scientific institutions and technical universities together form the successful FEMTECH network

[67] https://www.nsf.gov/career-life-balance/index.jsp

Recommendations

Education

A. Entry

1. **Increase Evidence-based Advocacy** to debunk false narratives about the differing skills of boys and girls in STEM to encourage women's participation; increasing awareness around programmes that promote affirmative action could create empathy.

2. **Make Specific Provisions that Encourage Women** such as supernumerary schemes at the IITs that have helped increase the number of women in IITs. More such provisions, across government and private institutes, can help more women enter STEM education.[68]

3. **Reduce Cost of Coaching** by making coaching institutes affordable and having specific scholarship schemes for girls to incentivise girls to enter STEM-related courses.

4. **Promote Public and Private Sector Investment in STEM Programmes** so that state, civil society organisations and corporations can together launch programmes and invest in initiatives that promote women's early training in STEM. Having schemes with financial incentives can be particularly helpful. Sponsored apprenticeship programmes that provide on-the-job training can enhance women's transition to the workforce. Microsoft's TechSaksham programme, for instance, provides skill-training to women engineers and helps them find employment.

5. **Implement Interventions in the Educational Ecosystem** such as improved teacher training programmes to train teachers to not propagate gendered expectations. Similarly, government initiatives that improve the foundational literacy and numeracy outcomes of young children can also help the future workforce be STEM ready. Similarly, schools can introduce gender-equity within the curriculum so that young girls are better prepared to navigate gendered ecosystems.

[68] https://news.microsoft.com/en-in/features/techsaksham-microsoft-india-sap-skilling-initiative/

Employment

A. Experience

1. **Establish Mentorship and Networking Programmes** to encourage successful women professionals to mentor and support younger women, through targeted conferences, events, discussions, etc., to foster a sense of belonging and community and reduce isolation at work. VigyanShaala's programme, "Kalpana", for example, creates communities for under-represented women in STEM to increase mentoring and networking opportunities.[69]

2. **Promote Diversity and Inclusion Training in STEM Workplaces** to ensure that colleagues and superiors are responsive to the needs of female colleagues through diversity and inclusion training.

3. **Remove Age Barrier for Research Grants and Fellowships** to allow more women to apply for various fellowships, particularly those who are re-entering jobs after a career break.

4. **Increase Empathy Around Affirmative Action** through targeted efforts like the supernumerary scheme in IITs, to address systemic challenges and discrimination faced by women and other diverse groups.[70]

B. Retention

1. **Reduce the Gender Pay Gap**, as the disparity in pay between men and women is one of the many reasons that discourages women's participation in STEM.[71,72] Having gender-responsive appraisal and evaluation policies can increase women's participation in STEM.

2. **Implement Gender-responsive and Flexible Policies** including an inclusive infrastructure, family friendly policies, childcare support, flexible work arrangements to retain women. IBM and Unilever, among others, are building on gender-equality commitments to promote a flexible work culture.[73]

3. **Provide Support to Women Re-entering the Workforce after a Career Break** by having provisions and policies that enable them to smoothly transition back. Returnship programs offered by companies like HCL (HCLTech Returnship) and Microsoft (The Leap Program) offer short-term professional engagements to those out of the workforce. Mahindra's 'Back to Mahindra' initiative is specifically designed to aid former female employees in transitioning back into work. Additionally, the Federal Bank has introduced the 'Maternity Work Buddy' initiative, offering support to expectant mothers by providing updates on the workplace during their maternity leaves. These initiatives exhibit considerable potential in facilitating the seamless reintegration of women into the workforce following career breaks, enabling them to recommence their professional trajectories.

C. Leadership

1. **Encourage and Promote Female Role Models** by increasing the visibility of successful women in STEM fields through mentorship programmes, panel discussions, seminars, and workshops.

2. **Increase Representation in Decision-making** through quotas for women's representation on governing boards, committees, and leadership positions. Diversity in decision-making leads to better decision outcomes and ensures that women's perspectives are considered.

[69] https://vigyanshaala.com/kalpana-2/
[70] https://iwwage.org/women-in-stem-in-india/
[71] https://www.kellyservices.com/global/siteassets/3-kelly-global-services/uploadedfiles/3-kelly_global_services/content/kgwi_women20in20stem_final.pdf
[72] https://www.bqprime.com/business/dear-india-inc-lets-talk-about-the-missing-women-in-stem
[73] https://www.adb.org/sites/default/files/publication/840111/gender-responsive-procurement-asia-pacific.pdf

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