

Indian Women and Girls in Science: Scholarships, Fellowships, Mentorship for Girl Students and Women in STEM

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Abstract - In the last few decades, there are some scholarship, fellowship and mentorship programs that have been started by various institutions, companies and the Government of India to equalize the visibility of women and girl students in the global science community. Science and gender equality are both important for worldwide development and is an important part of the United Nations 2030 Agenda for Sustainable Development. However, even today, a significant gender gap still exists at all levels of science, technology, engineering and math (STEM) disciplines around the world. This is the reason why every year 11 February is celebrated as the International Day of Women and Girls in Science, declared by the United Nations General Assembly to recognize the important role of women in the field of science and technology. According to the latest All India Survey on Higher Education released in the academic year 2019-20, the percentage of women in engineering and technology in India is less than 30%. Overall statistics on STEM enrollment (at all levels of higher education) show that women lag behind men, with over 56% enrollments in these fields.

Keywords: Gender equality, sustainable development, STEM, scholarship, fellowship and mentorship programs.

INTRODUCTION

“More women and girls in science equals better science,” UN Secretary-General António Guterres said. "Women and female students diversify research and expand the pool of science professionals, as well as provide new approaches to science and technology, which benefit everyone." Theoretically, science should be open to all, yet it is still overwhelmingly male. More girls are in school today than ever before, but women and girl students are still under-represented in STEM (Science, Technology, Engineering and Maths) education compared to men. Only one in three

researchers is female, and women account for just 35 percent of graduates in STEM-related fields. In cutting-edge fields like artificial intelligence, only 1 in 5 professionals (22%) is a woman.

These gender inequalities exist because they are deeply rooted in our societies. "This is due to the persistence of gender stereotypes and prejudices, which sometimes convince girls that scientific studies are not for them, despite their tremendous potential." The low number of women working in science directly reflects the discrimination they face across the world. The choices imposed on girls in school by gender stereotypes and norms shape their career and employment opportunities as adults. Promoting women and girl scientists requires a commitment to acknowledge the 'paradigm shift' and eventually remove structural barriers. Educational reform with new curriculum that will encourage girls' curiosity in scientific pursuits from an early age, including science and technology subjects through primary school. Initiatives such as new scholarships, internships, and training schemes, along with quotas, incentives, and mentorship programs, will encourage women to overcome barriers and help build their careers.

OBJECTIVE

- To study the conceptual meaning of STEM among Women's.
- To study the special scholarship, fellowship and mentorship programs to bridge the gender gap.

METHODOLOGY

The area of study is India for which the data for the study has been collected through secondary sources

like - official reports, records and articles, any published and unpublished material etc.

DISCUSSION

Institutions in India Working to Help Women and Girls in Science

IIT Delhi: has launched STEM (Science, Technology, Engineering, Mathematics) Mentorship program for schoolgirls with an aim to encourage girls towards choosing science as their career. The primary objectives of the program, designed for Class 11th girl students, are to train young students to think creatively about science and innovation, to provide them novel hand-on experience in solving research problems, and to help them form a stronger knowledge foundation.

IIT Mandi: The institute provides a merit scholarship including full tuition fee waiver and a monthly stipend of Rs.1000/- in the first year irrespective of category and parent's income. The merit scholarship will continue for four years of B. Tech. programs, subject to the good academic performance of the candidate indicated by minimum SPGA criteria of 7.0 for the previous two semesters and no disciplinary action.

IIM Bangalore: Citi Women's Leader Award: This merit-based award pays for the second year of tuition. At the end of the first year, candidates are chosen from the top 25% of the cohort. The institute nominates candidates, who are then selected based on their Statement of Purpose and Citi Group-scheduled interviews.

Plaksha University: This young university that aims to be a technical university for the future has launched the Ayalasomayjula Lalitha Fund to promote enrollment of girls and women in STEM education, especially in higher education. The STEM scholarship program helps meritorious and talented female students by providing opportunities to build a successful career and make an impact in the field. Assist in ensure 50% participation of women in all academic programs of Plaksha and to promote the participation of female candidates in STEM education, innovation and research.

Large-Scale Companies Working To Help Women and Girls in Science

IBM: STEM for Girls is an initiative launched in India by IBM in 2019 to improve education and career pathways for girls in government high schools. Our vision is to prepare over 200,000 high school girls here in India, across multiple states, through a 3-year program to pursue and understand their potential in 'New Collar' in STEM careers.

'Vigyan Jyoti': has been introduced in the year 2019-20 at the school level wherein meritorious girl students of Class 9-12 are being encouraged to pursue higher education and career in STEM field. The Department of Science & Technology started for meritorious girls with the aim to address the underrepresentation of women in different fields of Science Technology Engineering and Mathematics (STEM) in the country. The Navodaya Vidyalaya Samiti (NVS) is the implementation partner of Vigyan Jyoti. At present, 100 JNVs are acting as 'Vigyan Jyoti Knowledge Centres' to cater for girls from JNVs, KVVs, Govt. schools, army schools of small cities and rural areas for more diversity in STEM.

British Council: The British Council has launched the Women in STEM Scholarship Program in partnership with 21 UK universities to benefit women from the Americas, South Asia, East Asia, Western Balkans, Central Asia, Brazil, Egypt, Mexico and Turkey looking for women with a STEM background. Also wants to inspire future generations of women to pursue careers in STEM by providing financial support. There are two schemes under the scholarships 2023-Marter's Scholarship (for women pursuing postgraduate study) and Early Academic Fellowship (for women pursuing higher research studies) in Science Technology Engineering and Maths (STEM). The scholarships/ fellowships will be awarded on a merit basis. The scholarships will cover tuition fees, travel costs, visa charges, and stipends among other things.

Other Important Scholarships for Women and Girls
Pragati Scholarship Scheme (Govt): To provide encouragement and support to Girl Child to pursue technical education "Pragati Scholarship" has been launched by the MHRD from the year 2014-15 and implemented by All India Council for Technical Education (AICTE). Pragati is a scheme of AICTE aimed at providing assistance for Advancement of Girls participation in Technical Education. Education

is one of the most important means of empowering women with the knowledge, skill and self-confidence necessary to participate fully in the development process. This is an attempt to give every young Woman the opportunity to further her education and prepare for a successful future by “Empowering Women through Technical Education”.

DRDO Scholarship Scheme (Govt): 20 scholarships for girls who have qualified JEE Main and secured admission in the first year of the academic year in the relevant BE/B.Tech/B.Sc engineering course; 120000/yr. 10 Scholarships for Girls for admission to Post Graduate (ME/ M.Tech/ M.Sc), the candidate having valid GATE score and minimum CGPA/CPI score of 6.75 (for 10 point scale) or as per AICTE guidelines should be equal to 60% and subject to payment amount Rs.15500/- per month Rs.186000/- per year for a maximum period of two years.

Swami Vivekananda Single Girl Child Scholarship Scheme (Govt): This scholarship is launched to provide financial assistance to a single girl child of her parents who is pursuing a Ph.D. in Social Sciences. This is quite a great fellowship that has been offered by the University Grant Commission to encourage the higher education for the single child. This scholarship will help in reducing the dropout ratio of girl in the education field in comparison with boys due to weak financial condition. Beneficiary student gets INR 25,000 on the monthly basis for the initial 2 years as JRF (Junior Research Fellow); if promoted to SRF (Senior Research Fellow), they receive INR 28,000 on the monthly basis for 3 years; annual contingency grant of INR 10,000 annually for first 2 years and then INR 20,500 for rest of the 3 years; additional amount of 2,000 is also given for reader/escort assistance.

Tata Housing Scholarships for Meritorious Girl Students (Pvt): A scholarship amount of Rs. 60,000/- will be provided to the girl students undertaking courses of studies in the professional or technical fields. This scholarship will only be provided to the girl students belonging to underprivileged communities such as SC, ST and EWS.

Udaan Scheme: It was launched by CBSE in the year 2014. The main objective behind launching this

scheme is to increase the enrollment of girls students in technical educational institutes. Scheme gives an opportunity to girls students to pursue their career in engineering courses. Online and Offline weekend classes, Tablets with pre-loaded content, and many more benefits will be given to enrolled Girls Students.

Postdoctoral Fellowship for Women (Govt): The UGC has initiated a Scheme of Post-Doctoral Fellowship for Women candidates to those women candidates, who are unemployed holding Ph. Degree in their respective subject areas with an aim to accelerate the talented instincts of the women candidates to carry out the advanced studies and research.

WISE Post-Doctoral Fellowship (Govt): WISE Post-Doctoral Fellowship (WISE-PDF) is a new program of Department of Science & Technology (DST) that aims to provide opportunities to women scientists and technologists between the age group of 27-60 years who want to continue their research as bench-level scientists in basic and applied sciences. Candidates in regular employment are not eligible for WISE-PDF. However, women scientists who are temporarily employed in research or academics may apply in the scheme but they have to leave their earlier assignment if WISE-PDF project is approved. The position of research staff in any project, Post-Doctoral Fellow, Research Associate, etc. will be considered as temporary assignment.

Women Scientist Scheme-A (WOS-A): Women Scientists Scheme-A (WOS-A) provides platform to women scientists and technologists for pursuing research in basic or applied sciences in frontier areas of science and engineering. The scheme plays pivotal role in gender mainstreaming as it not only prevents brain drain from S&T system but also train and retain women in the system. The scheme initially offers opportunity to work as bench-level scientists and ultimately open new avenues for permanent position in Science & Technology. The Scheme is open throughout the year.

Women Scientist Scheme-B (WOS-B): Women Scientist Scheme-B (WOS-B) focuses on projects related to Science & Technology (S&T) interventions for societal benefit. Women scientists who wish to apply under this scheme are required to develop their

own project/proposals for scientific and technological solutions to address issues preferably at enhance quality-of-life the grassroots level.

Women Scientist Scheme-C (WOS-C): Women Scientist Scheme-C (WOS-C) is being implemented by the Patent Facilitating Centre of Technology Information Forecasting & Assessment Council (TIFAC). Hands-on training on different aspects of IPRs (e.g. patent search, know-how, drafting, filing, trademarks, trade secrets, copyright etc.) is major part of WOS-C curriculum in association with various Knowledge Partners (i.e. Law firms, Knowledge Processing Organizations (KPOs), Companies, Government agencies, and so on).

Gender Advancement for Transforming Institutions (GATI): Gender Advancement for Transforming Institutions (GATI) is an innovative Pilot Project. It ushers a novel intervention program for promoting gender equity in science and technology. GATI aims to nudge institutions of higher education and research towards supporting diversity, inclusion, and the full spectrum of talent for their own success and progression. Eligibility: Universities, Research institutions (of DST, CSIR, DBT, ICMR, ICAR etc.), Institutes of National importance, and other autonomous S&T Institutions.

CONCLUSION

It is important to understand the reason behind the low number of women in STEM. The first reason is that there are not so many women as role-models. Hence, girls in school do not even consider STEM as an option. Another reason is that STEM is not interesting to them and they do not see themselves as a part of it. Only when they realize the opportunities that STEM opens up will their interest pique. As many girls are out of STEM, we need to keep them engaged. They should be mentored and coached so that they can be active and interested in the STEM field. Existing women in technology can encourage more girls, which will help in increasing the total number in this field. It is important that a STEM skill and mindset is inculcated among students, especially girls, at a very early stage in the education system to remove prejudices and ensure gender equality.

It is well understood that Science, Technology, Engineering and Mathematics (STEM) skills are important for increasing employability in industries in India and around the world. The country's National Science Foundation predicts that 80 percent of jobs in the next decade will require STEM skills, and IBM estimates that STEM careers will provide 24 percent higher pay and longevity in the future. What a great opportunity, in fact, women make up nearly 50% of STEM graduates, but only 34% of the workforce in India's information technology industry, highlighting the gap between women's education and careers. A recent study found that most young educated girls in India have high aspirations of going into STEM careers such as medicine, engineering, agriculture and scientific research. However, converting their aspirations into realistic career paths is a challenge due to social stereotypes and family pressure (23%), lack of organizational support (19%), and gap in capabilities (10%).

As thought leaders in STEM for girls, find out how we can empower girls in India to pursue future careers in this field. More opportunities in STEM for girls is good not only for India but also for the world.

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