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### Women in STEM: Present Scenario

Dr. Anuradha Sharma Dubey

Department of Botany, School of Science & Technology, Vardhman Mahaveer Open University, Kota, Rajasthan, India

Corresponding Author: Dr. Anuradha Sharma Dubey

#### Abstract

A gender disparity persists at all levels in STEM disciplines in all over the world. It is observed from primary education level to various job positions. There are so many role models in STEM at international & national levels, grants and awards for women candidates to encourage their participation. Even past decade their increased interest are

also observed but still their participation is very low. So, it is necessary to change the nature of education of women so that the traditional gender bias can be prevented from flourishing in the next round of world economy. This paper encompasses various measures to improve women role to fill the gap.

**Keywords:** STEM, Prejudice, India

#### Introduction

108<sup>th</sup> Indian Science Congress held on January 2023 in Nagpur University, Maharashtra, with the theme "Science and Technology for Sustainable Development with Women Empowerment", and focused on women empowerment and their involvement in Science & Technology.

Honorable Prime Minister of India- Sh. Narendra Modi ji said in inaugural speech that "Our thinking is not just that we should empower women via science but also empowering science by the contribution of women, increasing participation of women is prove that women and science are both progressing in the nation." These words of the Honorable Prime Minister showed gratitude for all the women engaged in STEM fields.

Around the world a gender disparity persists at all levels in STEM disciplines. In more than two-thirds of the countries in the world, the participation of girls in subjects like Science, Technology, Engineering and Mathematics is very low. Science and related fields like Technology, Engineering and Mathematics are emerging very strongly and in these related fields a large number of job opportunities are being created. In jobs there is demand for STEM subjects is rising day by day. There is a very good scope of these subjects in terms of growth in career also. But the surprising thing is that in the world perspective, the participation of women in these science and technology engineering, mathematics fields is only and only 25% (Beede *et al.* 2011) <sup>[1]</sup>.

Shaw and Stanton (2012) <sup>[2]</sup> proposed a leaky pipeline effect explained decreasing trend of women candidates' presence in STEM that happens at primary school, secondary school undergraduate, post graduate, doctorate, post doctorate and faculty level positions.

The reason for this disparity in science is our prejudices also. The position of women in science can be strengthened only by overcoming prejudices. Mother of Telescope, Nancy Grace Roman once said, "I still remember asking my high school guidance teacher to take a second year of algebra instead of a fifth year of Latin. She looked down her nose at me and sneered, 'What lady would take mathematics instead of Latin?' teacher's biasness is clearly visible in her words.

In this context, British science journalist Angela Saini, who wrote in her book 'Inferior: How Science Got Women Wrong and the New Research That's Rewriting the Story', has always considered science to be neutral, but the reality is that science is mostly biased. It is full of prejudice because scientists themselves are victims of bias. Men and women are biologically different but no research in biology has been able to prove that women cannot do what a man can do. Still, in our society, there is a belief that women cannot perform well in some areas regarding some tasks. A huge wave of research is now revealing an alternative version of what we thought we knew. The new woman revealed by this scientific data is as strong, strategic, and smart as anyone else.

**Women Role Models:**

There are many women in the field of science who have achieved the level of fame and have earned a lot of name in their field; first name comes to the mind of Marie Curie, studied in our science books and came to know for the first time as a lady scientist, she is the first woman to have received the Nobel Prize and in not only one but two subjects, she has received the Nobel Prize in both Physics and Chemistry. Another name that is inspiration of many children is Kalpana Chawla, an American astronaut of first Indian-origin woman in space. Rajeshwari Chatterjee is the first woman to be appointed as faculty at IISc Bangalore, one of India's most prestigious institutes. Shakuntala Devi, Human Computer of India; Janaki Ammal, the great botanist; Nandini Harinath, the Scientist served as Deputy Operations Director on the Mars Orbiter Mission, Mangalyaan. Tessy Thomas, India's Missile Woman, India's first woman scientist to head a missile project. Ritu Karidhal, the rocket women of India. Sudha Murthy, Chairperson of Infosys Foundation and so many more women are famous in STEM fields.

**Grants and Awards for Women:**

Grants and awards are also given to encourage women in the field of science in India like- Women Scientist Scheme by DST, DBT, National Women Bio-Scientist Award, Women Excellence Award, Women in Science Lecture, Post Doctoral for Women Fellowship, L'Oreal India for Young Women in Science Scholarship, Indo-US Fellowship for Women in STEM National Post Doctoral Fellowship etc.

**Present Scenario of Women in STEM:**

According to the 2019-2021 study report of NTT-DATA IIT Company, 56% of women have increased their interest in these subjects. 16% of women consider STEM necessary to gain additional talent for the dream job. In 2019, women in STEM courses have increased to 22%, in 2021, women in STEM courses have increased to 32%. Currently, 62% of companies want to hire more and more women in STEM jobs. There has long been a gender disparity in STEM, but it is encouraging to note that 58% (the majority of employers) think hiring women can increase earnings. More than half of employers (51%) believe this can lead to innovation. 31% of employers plan to start programs to increase the participation of women in hiring. 38% of employers plan to increase the representation of women to 20%.

But it is really very surprising that while India produces the highest percentage of women STEM graduates in the world, about 40% but their share in STEM jobs in the country is very low i.e. only 14% (Aggarwal *et.al.* 2022)<sup>[4]</sup>.

Certainly, there has been a change in the last 50 years and women have shown their share in these fields also so it is necessary to change the nature of education of women so that the traditional gender bias can be prevented from flourishing in the next round of world economy.

Reinking and Martin (2018)<sup>[5]</sup> suggested that it can be improved by providing continued STEM experiences, professional women role models, building positivity and fostering curiosity about the potential of STEM careers.

Swarup and Dey (2020)<sup>[6]</sup> mentioned that inclusion of women role models, scholarships, comfortable workplace, flexible working hours, crèches and day care facilities can be included to support the women work-force.

Amirtham S. N. & Kumar A. (2023)<sup>[7]</sup> emphasized need of more gender-just affirmative action policies such as intersectional reservation for women in STEM academic careers, funding, legal protection against harassment, and representation of women in various committees and leadership positions.

Magdalena Skipper, Springer Nature's first female editor-in-chief, says, "We all know that women are still under-represented in STEM, but one important change is that we are now clear and clear that the current lack of diversity needs to change."

Together we will move forward and encourage women so that they can chase their dreams, they can make their own future without the shackles of any society, help her to fulfill their dreams and achieve their goals and for this we have to start from today.

In conclusion our educational formats and the systemic changes inherent in them will play their role, while also instilling confidence in girls. We have to take measures to improve women role to fill the gap by giving girls and women the skills and confidence to succeed in STEM. We have to improve STEM education and support girls since starting early education. Systems have to change themselves to attract women work-force, recruit and retain women in STEM fields at colleges and universities, improve hiring, retention and promotion pathways and intentionally create inclusive cultures.

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