

Gender Equality in Science

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THE past two years have been traumatic for all. COVID-19 infection, rush to create its vaccine, climate change consequences such as massive wildfires in the USA, Australia and Greece, locust storms in East Africa and so on have been unceasingly hovering over our lives. Yet in spite of the challenges faced by the global community there has been interconnectedness. There has been a knowledge exchange amongst scientific communities across the world. Collaborative research projects are underway in every field of science and technology.

However, unfortunately the disturbing challenge of gender inequality in science still persists despite several efforts. Over the years a lot of effort has gone into inspiring and engaging women and girls in science but they have still not been able to achieve full and equal access to and participation in science.

To achieve gender equality and the empowerment of women and girls, the United Nations (UN) General Assembly declared 11th February as the International Day of Women and Girls in Science in 2015. The consensus was that worldwide women scientists and science communicators are grossly underrepresented. According to the 2022 UN report, women are typically given smaller research grants than their male colleagues. While they represent 33.3 percent of all researchers, only 12 percent of members of National science academies are women. In fields such as artificial intelligence, only one in five professionals (22 percent) is a woman. A gender disparity is observed especially in the fields of Science, Technology, Engineering and Mathematics (STEM). As per the UNESCO Institute for Statistics, women make up only 29.3 percent of researchers globally.

The UN posted data in February 2020 regarding the gender imbalanced picture over time. According to the post, the Nobel Prize has been awarded to more than 900 individuals in the course of its history from 1901 to 2019 out of which only 53 of the winners are women; 19 in the categories of physics,

chemistry and physiology or medicine. Interestingly, even when women have been behind several scientific discoveries throughout history, only 30 percent of researchers worldwide and 35 percent of all students enrolled in STEM-related fields of study are women.

The media is no exception when it comes to gender bias. According to a UN report on the portrayal, participation and representation of women in the news media spanning 20 years and 114 countries, only 24 per cent women are heard, read about or seen in newspaper, television and radio. Even worse, 46 per cent of news stories reinforce gender stereotypes while only 4 percent of stories clearly challenge gender stereotypes. In general, only one in five experts interviewed by media is a woman.

The ‘Matilda effect’, which states about the consistent under-recognition of women scientists and women in science communication, is being talked about much in recent years. In the 19th century, Matilda Joslyn Gage campaigned for votes for women and for Native American rights. She also fought for proper recognition for women in science. In 1883, she penned, “No assertion in reference to women is more common than that she possesses no inventive or mechanical genius... Although women’s scientific education has been grossly neglected, yet some of the most important inventions of the world are due to her.”

Professor Margaret Rossiter from the Cornell University focused on the male privileges that were showered over the contribution of women to science. She coined the phrase ‘The Matilda Effect’ in one of her papers, in memory of Matilda Gage.

Katie Tavenner, a gender research specialist and International consultant from International Livestock Research Institute, Nairobi, Kenya explained, “The challenges that women and girls face are multi-faceted and varied across the globe, but they tend to cluster around lack of access to

resources, lack of access to opportunities, and, crucially, existing stereotypes and gender biases that may prevent women from even considering the possibility of entering these fields.”

There is an apparent anecdotal observation that there are many women in the field of science communication. In that case is there a need to address gender equality? Even after two centuries, unfortunately the ‘Matilda effect’ persists. A report published in *Nature* in June 2022, reveals quite a few striking observations. According to the report, women occupy more junior career positions than men. As the seniority of the position increases, the proportion of women in each position declines.

A UN report mentions that women have shorter, and less well-paid careers. Women are less likely to be named authors on any given scientific document. Their work is underrepresented in high-profile journals and they are often passed over for promotion.

Indian Perspective

In India too, there is a disparity in the male and female ratio. In a report published in *Current Science* in November 2021, all the issues of *Science Reporter*, a monthly popular science magazine published by CSIR, National Institute of Science Communication and Policy Research, New Delhi, published between the years 2010 and 2020, were analyzed. It was observed that the number of articles contributed by women was considerably lower than men. Also, women showed more interest in collaborative science writing rather than being a single author.

The Department of Science and Technology (DST), Government of India, has revealed that in India women are either not promoted or very often they drop out mid-career to attend to their families. In the 2018 Global Gender Gap report, India ranks 108 out of 149 countries. Science communication in India also is not gender inclusive to an extent.

In the Indian scenario, a woman has responsibilities at the home front. She juggles between two worlds – home and work. Childbearing, raising children, running the house and in addition gender bias at work place restricts her progress in career. Academic bullying from faculty members stalls her ability to work. For instance, it is often seen that men try to lead the dialogue during meetings.

Funding disparities can hinder advancement of women. Women report a lower sense of belonging as compared to their male counterparts. They feel a lack of respect leading to low confidence levels especially when they are put down. Even with better performance record, a promotion can be halted and offered to the ‘Head of the family’ who remains the breadwinner and hence needs the money more than any woman! All in all a woman has to strive harder to be successful and reach the pinnacle in the world of men. It is time for institutions to recognize the strength, styles and capabilities, of talented women.

Despite the challenges of gender discrimination and lack of recognition in the scientific community, innumerable

inspirational women have made historic contributions to science and helped in the advancement of science. Although many women scientists were not recognized in their own lifetimes, their achievements have helped generations to come.

Some changes are getting noticed in recent years. In fact, the glass ceiling recently broke for the first time in nearly 80 years, when CSIR India appointed Dr Nallathamby Kalaiselvi, a woman scientist, as the Director General. In India, it is heartwarming to note that we have had women as Presidents of Science Academies. We are also seeing an increase in the number of women achievers in the country who receive awards, fellowships and research grants. Hopefully there would also be an increase in the number of women in leadership positions.

The way to resolve the issue of gender bias is gender diversity and gender inclusion. Inclusion is a critical aspect, which leads to the economic progress and development of a country. Gender diversity is important not only for Science, Technology and Innovation (STI) but also for other sectors.

In India, a special focus on Women Empowerment in recent years has led to development of specially created policies to overcome some of the challenges that women in science often face. To address the gender gap problem, Department of Science and Technology (DST), Government of India has introduced the programme GATI (Gender Advancement through Transforming Institutions). The project aims at cultural transformation in establishing a Gender Equality framework in higher education Institutions. The focus is to increase participation of women in science. GATI draws inspiration from Athena SWAN Gender Equality Charter.

To monitor the issue of gender bias, Advance HE, a UK-based non-profit organization, has developed a framework called the Athena SWAN (Scientific Women’s Academic Network) Gender Equality Charter that supports strategic changes to advance gender equality for an amendment in higher education. SWAN was first established in the UK in 2005 to improve the representation of women in science, technology, engineering, mathematics and medicine (STEMM).

In a workplace, it becomes the responsibility of the human resource department to incorporate gender diversity and inclusion. However, every employee carries the onus of ensuring the diversity-inclusion culture. It is everybody’s business. Diversity of thought leads to better results. But without inclusion there will be no diversity. Gender inclusiveness is imperative for the progress of scientific awareness.

It is important to eliminate barriers to equality, celebrate diversity and promote inclusion to encourage a positive culture that will benefit the Nation’s scientific progress and achievement.

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