



EDITORIAL

Science, technology, and gender equality: Breaking barriers and building a stronger future

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Science and gender equality are vital for the achievement of the internationally agreed development goals, including the 2030 Agenda for Sustainable Development. Gender equality is a fundamental human right and a pillar of long-term development. Science and technology have the potential to transform communities and economies into more inclusive and equal places. Women and girls continue to confront considerable impediments to entry, involvement, and representation in scientific and technology disciplines in many regions of the world. Over the past decades, the global community has made a lot of effort in inspiring and engaging women and girls in science. Yet less than 30% of the world's researchers are women and continue to be excluded from participating fully in science (UNESCO, 2021). This editorial explores the relationship between science, technology, and gender equality, focusing on the historical challenges that women have encountered, the progress that has been made, and the possibility of a brighter future.

Historical barriers to women in science and technology

Throughout history, women have encountered many institutional, societal, and cultural obstacles that have restricted their involvement in science and technology. Gender stereotypes, discrimination, and unequal access to education and career prospects as explained are examples of these hurdles.

1. Gender stereotypes: The idea that certain scientific and technological domains are better suited for men has been reinforced by gender stereotypes. Women and girls are deterred from pursuing jobs in STEM (Science, Technology, Engineering, and Mathematics) fields by these misconceptions. The idea that women are less capable in these areas has persisted, even



though numerous studies have shown that gender does not dictate aptitude or interest in science and technology (Nosek *et al.*, 2009).

2. **Discrimination:** Discrimination against women in science and technology has been pervasive. Women often face biased hiring practices, wage gaps, and limited opportunities for career advancement. A study by Williams and Ceci (2015) reported that women in academic science positions face discrimination in the form of bias against hiring them for faculty positions, highlighting the need for gender equality reforms in academia.
3. **Unequal access to education:** Access to quality education is a critical determinant of future opportunities in science and technology. In many parts of the world, girls still face barriers to education, including limited access to schools, lower investment in girls' education, and early marriage, which disrupts their educational pursuits (UNICEF, 2021). Unequal access to education restricts the pipeline of women entering STEM fields.

Progress made in recent years

While significant challenges remain, there has been progress in promoting gender equality in science and technology. Various initiatives, policies, and organizations are working to address these barriers and create a more inclusive environment.

1. **Girls in STEM initiatives:** Over the years, various initiatives aimed at inspiring and supporting girls and women have been launched to promote gender equality in STEM. These efforts include programmes aimed at encouraging girls to pursue STEM education, promoting female mentorship, more emergences of female Vice Chancellors and implementing gender diversity policies in research institutions (Moss-Racusin *et al.*, 2012).
2. **Policy reforms:** Governments and organizations are beginning to understand the significance of gender equality in science and technology. Gender quotas and family-friendly policies have been established in various countries (European Commission, 2021). These policies aim to level the playing field and create equal opportunities for women.
3. **Awareness and advocacy:** A growing awareness of gender disparities in science and technology has led to increased advocacy for change. Organization for Women in Science for the developing World and other gender equality movements have shed light on the issues of harassment and discrimination that women face in STEM fields. These movements have prompted institutions to take action to address these issues.



Potential for a brighter future

Gender equality in science and technology is not only a matter of social justice but also a means to harness the full potential of human talent and innovation. To build a stronger future, several key steps can be taken:

1. Promote inclusive education: Ensuring equal access to education for all, regardless of gender, is crucial. This includes eliminating gender biases in teaching materials and providing mentorship programmes to encourage girls and young women to pursue STEM subjects. It is important to engage with girls early and boost their interest in STEM through a range of initiatives in schools and institutions.
2. Encourage diversity in leadership: Increasing the representation of women in leadership positions in science and technology organizations can serve as a powerful model for future generations. Organizations need to inspire and encourage women to move up the ladder and opt for leadership positions by instilling confidence in them. This can be achieved through diversity, inclusion initiatives and mentorship programmes.
3. Address harassment and discrimination: Institutions must take proactive steps to address and prevent harassment and discrimination in STEM fields. Clear reporting mechanisms and support for victims are essential to create a safe environment for all.
4. Interdisciplinary collaboration: The intersection of science and humanities offers a unique opportunity for innovation and solutions to complex global challenges. Collaborative research involving scientists and humanists can address issues like climate change, bioethics, and socio-cultural impacts of technology.

Conclusion

Gender equality in science and technology is a moral imperative and a critical driver of innovation and economic growth. Historically, women have faced significant barriers in these fields, but progress has been made through initiatives, policies, and advocacy efforts. Furthermore, breaking barriers in science and humanities is a necessary step towards building a stronger, more inclusive, and innovative future. Achieving gender equality in STEM fields, addressing social inequalities in humanities education, and decolonizing the humanities are essential for creating a more diverse and dynamic academic landscape.



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