

Forum:	The United Nations Committee on the Status of Women
Issue:	Developing strategies to address the gender gap in STEM education
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Introduction

Gender gaps in STEM refer to the lack of representation and opportunities between men and women in these Science, Technology, Engineering, and Mathematics fields. Although the issue of gender gaps between men and women may seem simple, it is truly a multifaceted issue that is important to address. Having a gender gap, limits the potential for innovation and growth in these STEM fields. By addressing and working towards this issue, we can promote diversity and inclusion in STEM education and employment. We can also create more equitable opportunities for all individuals to contribute their skills and talents to these important fields. However, it is clear that the biggest issue as to why the gender gap in stem is so hard to address is due to the severity of the stereotype threats

A severe stereotype that restricts women from partaking in and gaining interest from STEM fields is the stereotype that women are not as good at math and science as men. This stereotype suggests that women are less skilled in math and science provide negative outlooks on women's interest in these fields. Furthermore this can discourage them from pursuing STEM education and careers. Despite research and evidence that suggest that women can and excel in STEM, these stereotypes persist. Such biases can create a perception that women are less capable or less interested in STEM subjects, leading to fewer opportunities and discouragement for women pursuing these fields. It is important to recognize that these stereotypes are not based on factual evidence or inherent differences in abilities, but rather societal biases that have been perpetuated over time. They can limit women's access to resources, mentorship, and opportunities in STEM fields, which in turn restricts their ability to develop and sustain interest in these areas. Efforts are being made to challenge these stereotypes and promote inclusivity and gender equality in STEM. By providing support, representation, and equal opportunities for women in STEM education and careers, we can help break down these barriers and encourage more women to pursue their interests in these fields. An important aspect of this stereotype ignores the fact that women have also made significant contributions to STEM fields throughout history

Another yet untrue stereotype that restricts women from taking interest in STEM fields is that women are not interested in STEM fields. This stereotype suggests that women inherently lack enthusiasm or passion for these areas. However, this stereotype ignores the fact that cultural biases and societal expectations can limit women's exposure to STEM fields and their opportunities to pursue these careers. Family situations and traditions can often

restrict women from studying STEM fields. In many societies, there is a prevailing belief that certain fields, such as science, technology, engineering, and mathematics (STEM), are more suitable for men. One way family situations and traditions restrict women from studying STEM fields is through limited educational opportunities. In some families, resources and support may be disproportionately allocated towards male family members' education, while the educational aspirations of female family members may be disregarded or discouraged. This can result in limited access to quality STEM education for women, hindering their ability to pursue STEM careers. Moreover, cultural expectations and gender roles can also play a significant role in restricting women from STEM fields. Traditional gender norms often assign domestic responsibilities to women, which can create time constraints and societal expectations that prioritize caregiving over pursuing a career in STEM. These expectations can discourage women from dedicating time and effort to studying STEM subjects or pursuing STEM careers

Lastly, a big misconception and stereotype of women is that they can't pursue STEM careers due to their family responsibilities. In families, especially in traditional families, it is clear that women are often expected to take on more family responsibilities than men. They are expected to do more domesticated jobs. For example they are expected to take care of the household and children, while men are the breadwinners. This division of labor limits women's opportunities and freedom outside of their homes. There is also family pressure of marriage and children. Because of this pressure most women choose careers that have less work with more free time. However times have changed and most of these gender norms aren't expected of women. But this misconception still persists, so women do not want to pursue careers in STEM because some STEM fields may require long hours or travel.

One of the most important reasons as to why women might not consider a career path in STEM is because of the workplace culture. For instance, Women in STEM fields often face various challenges and disparities in the workplace. Also known as the pipeline problem. Research suggests that gender discrimination and biases are prevalent, leading to unequal treatment and opportunities for women. Some common forms of gender disparities reported by women in STEM jobs include earning less than their male counterparts for the same job, being treated as less competent due to their gender, experiencing subtle forms of discrimination or microaggressions, and receiving less support from senior leaders compared to men in similar positions. Unconscious biases can also play a role in perpetuating gender disparities in STEM workplaces. These biases can affect hiring decisions, promotions, and grant funding, leading to the underrepresentation of women in STEM. Additionally, the demanding nature of STEM careers can create challenges for work-life balance, and some women may face barriers in managing family responsibilities while pursuing their careers. Since STEM fields have traditionally been male-dominated for much of history, there is a stigma in women in STEM, it leads to an unfamiliar hostility and unwelcoming environment for women

Definition of Key Words

Pipeline problem

The issue of underrepresentation or lack of diversity at various stages of a career or educational pathway. In this case it refers to the underrepresented group of women in STEM fields

Underrepresentation

The lower presence or proportion of women in STEM fields compared to men. It highlights the gender gap

Gender Stereotypes

The preconceived and generalized beliefs of how individuals of a particular gender should behave, or think

Cognitive Ability

The role of cognitive ability has been explored as a potential explanation for the gender gap in STEM. Research has examined whether there are inherent cognitive differences between men and women that may influence their pursuit of STEM careers

Background

History of gender gaps in STEM

Gender gaps in STEM have existed throughout history, Here are some prime examples including different movements that try to deal with women facing significant barriers to entry and advancement in these fields.

Starting with World War II. During World War II, women played a critical role in scientific research and development. During the war, many men were drafted into military service, creating a shortage of skilled workers in various industries and the lack of jobs. As a result, women were given opportunities to fill these positions. These opportunities shifted and challenged the traditional gender roles. It helps to provide women with valuable experiences and exposure to STEM field. After the war, women were more motivated and some women continued to pursue careers in STEM, contributing to the gradual breaking down of gender barriers in these disciplines.

Secondly, the women's suffrage movement. The women's suffrage movement was a social and political campaign that fought for women's right to vote. It took place in the late 19th and early 20th centuries and The movement aimed to challenge the prevailing gender norms and achieve equal political rights for women. continued through the early 20th century. Women's suffrage activists organized campaigns, protests, and demonstrations to demand the right to vote, as well as equal rights and opportunities for women in all areas of society. Some movements in the women's suffrage movements include equal citizenship. These people fought for women to be recognized as full citizens with the same legal and political rights as men. Another movement was legal reforms. This movement sought changes to laws that discriminated against women, such as property rights, divorce laws, and child custody laws. Lastly an important movement was the movement of education and employment. Women's suffragists advocated for equal access to education and employment opportunities, challenging societal norms that

limited women's roles to the domestic sphere. Social and Economic Reforms: The movement aimed to address issues like labor rights, working conditions, and social welfare, recognizing that these areas impacted women's lives and their ability to participate fully in society. The movement was successful in securing voting rights for women in several countries, including the United States, the United Kingdom, Canada, and Australia. The efforts of these suffragists paved the way for greater gender equality and women's empowerment in many areas of life.

Another key moment in history that is significant to working for women's rights was in the 1960s and 1970s. The women's liberation movement of the 1960s and 1970s brought attention to gender disparities in education and employment, including in STEM fields. The women's liberation movement was a movement that aimed to address gender-based discrimination and inequality. Especially in areas such as employment, education, and reproductive rights. The women's liberation movement grew out of the civil rights movement. Women's liberation activists challenged traditional gender roles and norms, advocating for greater autonomy and freedom for women. They also sought to raise awareness about issues such as sexual harassment, domestic violence, and unequal pay. The efforts of this movement led to the passing of laws such as Title IX. Title IX was a law in prohibiting sex discrimination in education. This further led to *Roe v. Wade*, which legalized abortion in the United States. This movement helped change societal attitudes towards gender roles and paved the way for subsequent feminist movements.

Furthermore, the 1980s and 1990s saw increased efforts to address gender gaps in STEM, including the establishment of organizations like the Association for Women in Science and the Society of Women Engineers. Around this time The Beijing Platform for Action was an international agreement that was adopted at the United Nations Fourth World Conference on Women in Beijing, China in 1995. The Beijing Platform is a comprehensive blueprint for achieving gender equality and empowering women worldwide. The platform covers 12 critical areas including women and poverty, Education and training of women, women and health, violence against women, women and armed conflict, women and the economy, women in power and decision making, institutional mechanisms for the advancement of women, human rights of women, women and the media, women and the environment, and the girl child. The Beijing Platform for Action outlines specific goals, strategic objectives, and actions to be taken by governments, international organizations, and civil society to promote gender equality.

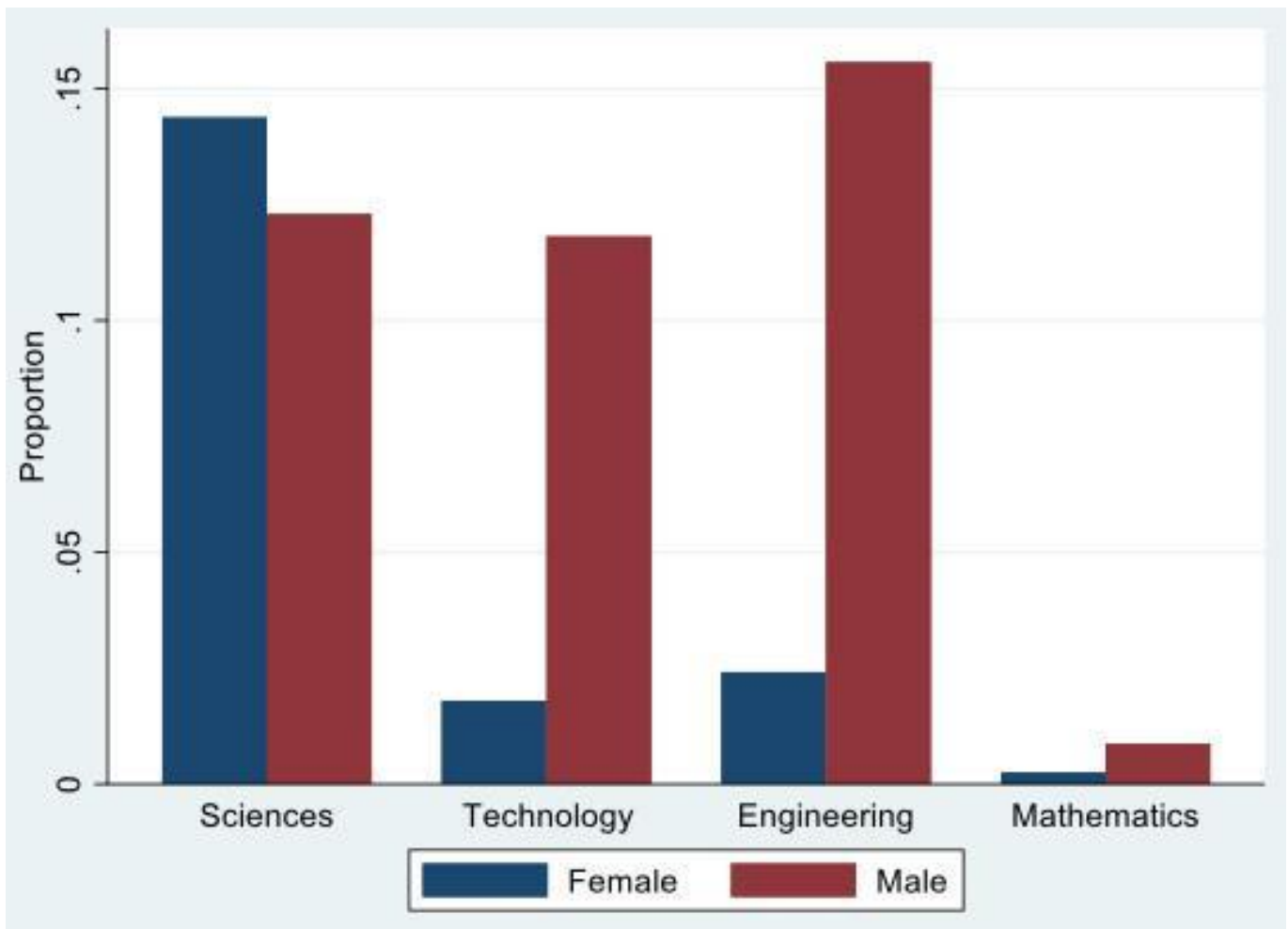


Figure 1: A bar chart showing the difference of female and male in STEM fields (CEPR)

Gender gaps in STEM now

Although progress has been made throughout the years, gender gaps in STEM are unfortunately still prevalent. In these times women struggle in many aspects. For example in representation. Women are still severely underrepresented in STEM fields. In the United States studies show that women only make up 28% of the STEM workforce. Education is also still an issue. It shows that with research done in 2019 from the National Girls Collaborative Project, that women are less likely to pursue degrees in STEM fields. It shows that only 22% of women earned degrees in computer science and 21% earned a degree in engineering in the United States. Another issue is with pay. Women in stem fields still earn less than men. It says according to the American Association of University Women, that in STEM jobs women earn 35% less than men. Leadership is also a prevalent issue. Studies from the National Science Foundation showed that there is an underrepresentation of leadership roles in STEM from women. It also shows that there are only up to 24% of women that hold full time professorships in science and engineering fields. Lastly, there is bias and discrimination against women in STEM. A study done by the National Academies of Sciences, Engineering, and Medicine found that women in STEM fields experience gender based harassment and discrimination at higher rates than men. While progress has been made towards addressing gender gaps in STEM, there is still much work to be done to ensure that women are represented and valued equally in these fields.

Major Parties Involved

United States

The United States has been actively working to bridge the gender gap in STEM fields through various initiatives, organizations, and policies. Efforts include promoting diversity and inclusion in STEM education, increasing the representation of women in STEM careers, and advocating for equal opportunities and pay. The United States has taken educational Initiatives. The U.S. government has implemented various educational initiatives to encourage girls and women to pursue STEM education. Programs like the National Girls Collaborative Project and the White House Council on Women and Girls have aimed to promote STEM opportunities and support for women and girls. Secondly, the United States implemented more research and data collection. The United States has invested in research and data collection to better understand the gender gaps in STEM fields. This data helps identify barriers and develop strategies to increase female representation in STEM careers. Lastly, workplace diversity and Inclusion Many companies and organizations in the U.S. have recognized the importance of diversity and inclusion in the workplace. They have implemented initiatives to promote gender equality, eliminate bias, and create inclusive environments that attract and retain women in STEM professions.

National Girls Collaborative Project (NGCP)

NGCP is a collaborative network of organizations in the United States that work together to increase the participation of girls and women in STEM fields. They provide resources, support, and promote collaboration among various stakeholders.

National Center for Women & Information Technology (NCWIT)

NCWIT is an organization that works to increase the meaningful participation of women in computing and technology. They provide resources, research, and programs focused on addressing gender disparities in the tech industry.

UNESCO

The United Nations Educational, Scientific and Cultural Organization (UNESCO) promotes gender equality in education and science. They work towards bridging gender gaps in STEM through initiatives, reports, and global campaigns.

Previous Attempts to Resolve the Issue

Over the years, several attempts have been made to resolve gender gaps in STEM. Although they have made significant changes and benefitted the gender gaps in STEM, the issue still remains. For example, in 1972, the United States passed Title IX, a federal law prohibiting sex discrimination in education. This law has helped increase opportunities for women in STEM education and athletics. It was enacted in 1972 as part of the Education

Amendments and has had a significant impact on promoting gender equality in educational institutions. The Education Amendments that is also known as the Higher Education Amendments was one of the most significant amendments the legislation Title IX. This Amendment which prohibits discrimination on the basis of sex in educational institutions receiving federal aid. The Title IX states that "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance." It is important to note that there may have been other education amendments over the years, but the Education Amendments of 1972, with Title IX as a key component, are widely recognized for their impact on education and gender equality [3]. Although this amendment was a huge milestone, discrimination on gender still persists. And job opportunities and pay especially in stem fields are significantly lower for women as they are still discriminated against.

Another previous solution that was made was Affirmative Action Policies. These Affirmative action policies were put in place in the United States in the 1960s to promote equal employment opportunities for women and minorities. These policies have helped increase the representation of women in STEM fields.

Further more, there were different gender diversity initiatives. Many companies and organizations have implemented gender diversity initiatives to address gender gaps in STEM fields. These initiatives include promoting diversity and inclusion in recruitment, providing mentorship and support for women in STEM, and advocating for equal opportunities and pay. Moreover, there were international efforts, various international organizations, such as UNESCO, have launched initiatives to address gender gaps in STEM fields globally. These efforts include promoting gender equality in education, increasing opportunities for women in STEM careers, and advocating for policies that support gender equity.

Possible Solutions

A possible solution to the gender gap in stem could be to provide role models and mentorship. Children, especially girls, that are interested in STEM fields lack role models. So, they should be provided with access and exposure to role models and mentorship. By promoting visible role models and mentors from an early age, such as increasing the exposure and awareness of female pioneers in education systems we can provide support and guidance for women in STEM. Using mentorship we can connect girls and women with successful female professionals in STEM to foster one on one relationships. This could allow these young girls to gain inspiration while receiving guidance, and valuable insights into career pathways. Mentors could be anybody that support young girls in their decision and interest in STEM fields, such as teachers or even parents, or professionals in the field who can provide real-world experience and lessons, as well as resources. Having role models who have successfully navigated the challenges and biases within STEM fields can inspire and motivate young girls and women to pursue their interests in STEM. Seeing someone who looks like them and has achieved success in their chosen field can help break down barriers and provide a sense of possibility and belonging.

Another possible solution to this could be collaboration and partnerships. Collaboration between educational institutions, government agencies, non-profit organizations, and industry stakeholders is crucial for addressing gender gaps in STEM. By pooling resources, sharing best practices, and working together, these stakeholders can create a more coordinated and impactful approach towards gender equity in STEM. One way collaboration and partnership can help is by creating mentorship programs and support networks for women in STEM. These programs can provide guidance, encouragement, and valuable connections to help women navigate their careers in male-dominated fields. Collaboration can also lead to the development of initiatives aimed at increasing the representation of women in STEM. For example, partnerships between universities, industry leaders, and government agencies can result in the creation of scholarships, internships, and outreach programs specifically targeted towards young girls and women. These initiatives can help break down barriers and inspire more women to pursue STEM education and careers furthermore, collaboration and partnership can foster a supportive and inclusive environment within STEM organizations. By working together, stakeholders can implement policies and practices that promote gender equity, such as equal pay, flexible work arrangements, and family-friendly policies.

Bibliography

- American Association of University Women. “The STEM Gap: Women and Girls in Science, Technology, Engineering and Math – AAUW : Empowering Women since 1881.” *AAUW*, 2020, www.aauw.org/resources/research/the-stem-gap/. Accessed 27 Nov. 2023.
- Burkett, Elinor. “Feminism - the Second Wave of Feminism.” *Encyclopædia Britannica*, 2019, www.britannica.com/topic/feminism/The-second-wave-of-feminism. Accessed 27 Nov. 2023.
- Charlesworth, Tessa E. S., and Mahzarin R. Banaji. “Gender in Science, Technology, Engineering, and Mathematics: Issues, Causes, Solutions.” *Journal of Neuroscience*, vol. 39, no. 37, 11 Sept. 2019, pp. 7228–7243, <https://doi.org/10.1523/JNEUROSCI.0475-18.2019>.
- “Closing the STEM Gap.” *AAUW : Empowering Women since 1881*, www.aauw.org/resources/article/closing-the-stem-gap/. Accessed 27 Nov. 2023.
- “Data - OECD.” *Www.oecd.org*, www.oecd.org/gender/data/why-dont-more-girls-choose-stem-careers.htm. Accessed 27 Nov. 2023.
- Drozda, Daryl. “Breaking Barriers: Women in STEM.” *GUS Canada*, 15 Aug. 2023, guscanada.com/breaking-barriers-women-in-stem/#:~:text=Today%2C%20women%20constitute%20about%2047. Accessed 27 Nov. 2023.
- Egerstrom, Christina. “Discover How Sweden Is Promoting Gender Equality in Engineering.” *Iknalsemikan*, 3 Mar. 2022, www.iknalsemikan.com/post/discover-how-sweden-is-promoting-gender-equality-in-engineering. Accessed 27 Nov. 2023.
- Fry, Richard, et al. “STEM Jobs See Uneven Progress in Increasing Gender, Racial and Ethnic Diversity.” *Pew Research Center*, 1 Apr. 2021, www.pewresearch.org/science/2021/04/01/stem-jobs-see-uneven-progress-in-increasing-gender-racial-and-ethnic-diversity/. Accessed 27 Nov. 2023.
- “Gender Gap in the STEM Fields and Proposed Intervention Programmes.” *UN Women – Europe and Central Asia*, eca.unwomen.org/en/digital-library/publications/2021/8/gender-gap-in-the-stem-fields-and-proposed-intervention-programmes. Accessed 27 Nov. 2023.

HISTORY.com editors. "World War II." *History.com*, A&E Television Networks, 29 Oct. 2009, www.history.com/topics/world-war-ii/world-war-ii-history. Accessed 27 Nov. 2023.

Huang, Junming, et al. "Historical Comparison of Gender Inequality in Scientific Careers across Countries and Disciplines." *Proceedings of the National Academy of Sciences*, vol. 117, no. 9, 18 Feb. 2020, www.pnas.org/content/early/2020/02/14/1914221117, <https://doi.org/10.1073/pnas.1914221117>. Accessed 27 Nov. 2023.

National Archives. "Woman Suffrage and the 19th Amendment." *National Archives*, 15 Aug. 2016, www.archives.gov/education/lessons/woman-suffrage#:~:text=Beginning%20in%20the%20mid%2D19th. Accessed 27 Nov. 2023.

Piloto, Clara. "The Gender Gap in STEM | MIT Professional Education." *Professional Education*, 13 Mar. 2023, professionalprograms.mit.edu/blog/leadership/the-gender-gap-in-stem/#:~:text=In%202023%2C%20the%20gender%20gap. Accessed 27 Nov. 2023.

Seth, Aashraya. "Empowering the Future: How STEM Education Is Transforming the Lives of Girls in India ." *The Times of India*, 27 Nov. 2023, timesofindia.indiatimes.com/blogs/nonpartisan-perspectives/empowering-the-future-how-stem-education-is-transforming-the-lives-of-girls-in-india-e2-80-8d/.

shanKariasacademy. "Gender Gap in STEM | Current Affairs." *Www.iasparliament.com*, www.iasparliament.com/current-affairs/gender-gap-in-stem#:~:text=Gender%20divide%20%E2%80%93%20Globally%2C%2018%25. Accessed 27 Nov. 2023.

Singapore, I, et al. *S O O K N I N G c H U a K I M B E R L Y K L I N E S I E R I N L I M S T E M G E N D E R G A P the Gender Gap in STEM in Singapore*. 27 Nov. 2023.

"The Science Gender Gap: How Is Australia Faring?" *Www.baysidegroup.com.au*, 9 Feb. 2023, www.baysidegroup.com.au/employers/the-science-gender-gap-how-is-australia-faring. Accessed 27 Nov. 2023.

Thornton, Alex. "Gender Equality in STEM Is Possible. These Countries Prove It." *World Economic Forum*, 5 Mar. 2019, www.weforum.org/agenda/2019/03/gender-equality-in-stem-is-possible/. Accessed 27 Nov. 2023.

Tian, Jing, et al. "Tracing the Origins of the STEM Gender Gap: The Contribution of Childhood Spatial Skills." *Developmental Science*, 22 July 2022, <https://doi.org/10.1111/desc.13302>. Accessed 13 Jan. 2023.

"While STEM Gender Gaps in the U.S. Persist, There Are Reasons for Encouragement." *Economicgraph.linkedin.com*, 15 Mar. 2023, economicgraph.linkedin.com/blog/while-stem-gender-gaps-in-the-u-s-persist-there-are-reasons-for-encouragement. Accessed 27 Nov. 2023.