

CSW

Study Guide

Advancing Gender Equality in STEM Fields
and Professional Leadership Roles

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I. Letter from the Secretary-General

Highly Esteemed Delegates,

First and foremost, I would like to express my sincere gratitude for your interest and enthusiasm regarding our conference. My name is Yaren Keçili, and I have the honor of serving as your secretary-general for the 8th edition of the Troy Model United Nations Conference this year. I embrace this role with immense appreciation.

Similar to previous years, we have dedicated our efforts to creating a range of engaging and diverse committees for your benefit. We take great pride in the work we have prepared for you and sincerely hope that you will find it beneficial as well. Both the academic and operations teams have been working very hard to serve you to the best of their abilities and give you an unforgettable experience.

I wish to show my gratitude to the chair board and Simay Kırgız, who is going to serve as your Under-Secretary-General. All my teammates made great efforts in the process leading up to the conference. Hence, they need all the praise for their hard work.

I trust that all our delegates will engage in enlightening discussions throughout the three days they are with us, cultivate creative solutions to global challenges, be at the forefront of diplomacy and academia, and enjoy the experience in the process. Once again, I would like to welcome you all to both the conference and the committee. Buckle up and get ready because We have prepared an incredible ride for you.

Yours Sincerely,

Yaren Keçili

Secretary-General of Troy Model United Nations 2025

II. Letter from the Under-Secretary-General

Dear Delegates,

First of all, I would like to give you the warmest welcome to the eighth annual edition of TroyMUN'25! My name is Simay, and it is both a pleasure and an honour to serve as your Under-Secretary-General for this year's conference under the Commission on the Status of Women. I would also kindly thank my wonderful chairboard ; Ela, Şevval and Eylül for their highly appreciated efforts. I know that for many of you, Model UN is not only about debating and writing resolutions, but also about connecting with people, learning new perspectives, and growing as individuals. That is exactly what I hope this committee will give you: a space where you feel comfortable expressing your ideas, challenging one another respectfully, and working together to shape meaningful discussions and fruitful debates.

As the Chair Board, we are especially excited to see passionate and ambitious delegates who care deeply about equality, politics, and international relations. Women's rights in the spheres of STEM and leadership are incredibly important issues in today's world, and we believe you all have the ability to bring fresh, creative, and impactful ideas to the table as the youth who will shape the future. This study guide is just a starting point, it will give you some background on our agenda, but I highly encourage you to go further, explore the topic from your own angle, and come prepared to share your unique perspective.

With all my best,

Simay Kırgız

Under-Secretary-General responsible for
Commission on the Status of Woman

III. Introduction to the Committee

The Commission on the Status of Women (CSW) is part of the United Nations Economic and Social Council (ECOSOC). It was created in 1946 to promote gender equality and support the rights of



women around the world. The CSW was one of the first UN bodies focused on human rights, and it was formed to make sure women's voices were included in rebuilding societies after World War II [\[1\]](#).

The CSW meets every year at the UN Headquarters in New York. During these sessions, representatives from countries, civil society groups, and UN agencies come together to discuss progress, share ideas, and set global standards on issues affecting women and girls. One of the CSW's most important achievements is the Beijing Declaration and Platform for Action, adopted in 1995, which still guides international work on gender equality [\[2\]](#).

Each year, the CSW focuses on a specific theme. For instance in 2025, the 69th session looked at gender equality in relation to climate change, digital technology, and crisis recovery. The goal was to promote policies that protect and empower women, especially in vulnerable communities [\[3\]](#).

The CSW also helps monitor how countries follow international agreements like the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW). It works closely with UN Women, the UN agency that leads efforts on gender equality [\[4\]](#).

Through its work, the CSW helps shape global discussions on women's rights, push for policy changes, and support countries in reaching the Sustainable Development Goal(SDGs) — especially Goal 5, which focuses on achieving gender equality and empowering all women and girls [\[5\]](#).



IV. Introduction to the Agenda Item

A. Overview of the Agenda Item

Gender equality in STEM (Science, Technology, Engineering, and Mathematics) and leadership positions remain extremely crucial today. Despite advances in education over the years, women continue to be under-represented both in fields of STEM and in high-level roles. This persistent imbalance is mainly caused by early educational biases and stereotypes, which discourage girls from pursuing STEM from a young age. This imbalance not only affects fairness but also limits global innovation, economic growth, and inclusive decision making. Additionally, social norms and expectations often result in higher dropout rates for girls in STEM pathways [\[6\]\[7\]](#).

In today's world women hold only about 28% of jobs in STEM worldwide, and even less reach leadership roles with less than 20%. Women also make up only one third of researchers globally. UNESCO's Global Education Monitoring report (2018–2023) shows women make up approximately 35% of STEM graduates, with no real progress in the last decade.

Furthermore, women face persistent biases and workplace barriers: nearly 40% of women in

STEM report sexist behavior, and technical fields such as Artificial Intelligence (AI) and Information and Communications Technology (ICT) often have as little as 22% of female participation [\[8\]](#).

Gender equality in STEM and professional leadership is not only a critical matter but also an economic necessity. Oliver Wyman's analysis further reveals that expanding equal opportunities for women could double global growth rates, increasing world GDP by more than 20%. The Science Summit 2025 reports that closing gender gaps in STEM alone could enhance economic productivity by as much as 27% regionally. On a corporate level, studies show that moving from zero to 30% female leadership can yield a 15% increase in profitability. Countries with gender-balanced STEM fields tend to report higher innovation outcomes, including more patents and scientific publications per capita. These factors show us that advancing women's participation in leadership roles is not just a matter of equality but a key step to achieve stronger and more sustainable global economic performance [\[9\]](#).

B. Historical Background of Women in STEM and Leadership

Over time, women's involvement in STEM and leadership areas has grown significantly, though not without challenges. Historically, women faced systemic barriers, including educational exclusion and societal biases, that limited their participation in science and leadership. As early as the late 19th and early 20th centuries, women began entering scientific fields, but they remained vastly underrepresented. The founding of organizations like the American Association of University Women (AAUW) and later the Society of Women Engineers (SWE) in 1950 provided crucial networks and support to increase women's access to STEM education and careers [\[10\]](#)[\[11\]](#).

Adding on, UN data confirms that women now make up around 30% of the world's researchers, reflecting gradual progress in gender representation across disciplines. This steady increase, though encouraging, still highlights the long journey toward equality.

Throughout history, pioneering women have broken barriers and made groundbreaking contributions despite the obstacles they faced. Figures such as Marie Curie, the first woman to win a Nobel Prize—and the only person to win in two different scientific fields—symbolize the breakthrough of women in science. In engineering and computing, innovators like Grace Hopper, Lillian Moller Gilbreth, and Edith Clarke laid technological and organizational foundations that shaped entire industries. Meanwhile, scientists such as Rosalind Franklin and Chien-Shiung Wu made critical advances in DNA research and nuclear physics, though their work was often overlooked during their lifetimes. From the Global South, Katherine Johnson, Wangari Maathai, and Gladys West contributed to achievements ranging from spaceflight calculations to environmental conservation and the development of GPS technology. These examples illustrate that women's expertise has been a driving force behind many of the world's most important scientific and technological advances [\[12\]](#)[\[13\]](#).

The growth of women's participation in STEM and leadership has also been influenced by policy developments and institutional support over the past decades. The United Nations has played an essential role in raising awareness, most notably through the establishment of the International Day of Women and Girls in Science in 2015, which spotlights the persistent gender gaps in STEM [\[14\]](#)[\[17\]](#). Programs from UN Women and UNESCO, including influential reports such as *Cracking the Code*, have provided evidence-based recommendations for increasing girls' engagement in STEM education [\[15\]](#). Alongside these

international efforts, grassroots and NGO-led movements—such as Stemettes in the UK—have sought to build leadership pipelines by offering mentorship opportunities, role models, and exposure to STEM career paths. These combined initiatives have worked to challenge the gender imbalance and promote more inclusive professional environments [16]. Thanks to these pioneers, organizations, and policies, women today are increasingly visible and influential in STEM and leadership roles worldwide.



However, despite this progress, they still hold a limited share of leadership positions and remain underrepresented in scientific authorship and patent registrations. This underscores the need for continued advocacy, targeted policy reforms, and long-term

institutional commitment to ensure that gender equality in STEM and professional leadership becomes not just a goal, but a global standard [17].

C. Root Causes of Today's Challenges

1. Gender Stereotypes and Social Expectations

Despite progress toward gender equality in STEM and leadership, women continue to face deeply rooted obstacles. A key barrier lies in traditional gender roles and societal expectations that shape beliefs from childhood.

Global education systems have long reinforced the idea that STEM

subjects like math and science are more suited to boys. These stereotypes

undermine girls' confidence and interest in these subjects—even when they outperform their male peers—creating a strong social message that discourages STEM engagement from an early age. Media and cultural portrayals further entrench these norms; for instance, there are significantly more male characters depicted as scientists and engineers in popular films.



These stereotypes influence how young people perceive STEM roles and their own potential to pursue them [\[18\]\[19\]](#).

Traditional expectations of gender within society reinforce the STEM divide: while boys are often encouraged to be ambitious and technical, girls may be subtly guided toward caregiving or humanities paths. During adolescence, distancing from such strict gender roles has been shown to increase young women's interest and achievement in STEM, indicating that these social pressures are actively stifling potential [\[20\]](#).

2. Educational and Career Access Gaps

Another persistent challenge is the inequality in career advancement opportunities, educational disparities, and access issues. UNESCO research estimates that globally, women represent only around 35% of STEM graduates, and this number has remained unchanged for years. Women also occupy only about 30% of research positions worldwide, meaning many talented individuals never complete the journey into professional STEM roles. Educational systems often lack the foundations to support girls equally—whether through biased curricula, a lack of female teachers in STEM, or insufficient role models—and this disproportionately affects marginalized students, widening the gap further [\[21\]](#).

Access challenges extend beyond the classroom. Structural inequalities, such as employers investing less in upskilling female employees, contribute to career stagnation and limit advancement opportunities for women already in the STEM workforce. Additionally, persistent pay gaps, less representation in senior roles, and workplace cultures that undervalue women continue to hinder sustained progress [\[22\]\[23\]](#).

3. Lack of Mentorship and Support Systems

A third significant root cause is the lack of mentorship and support systems. Studies from the UNDP and other organizations highlight that girls and women often lack access to mentors

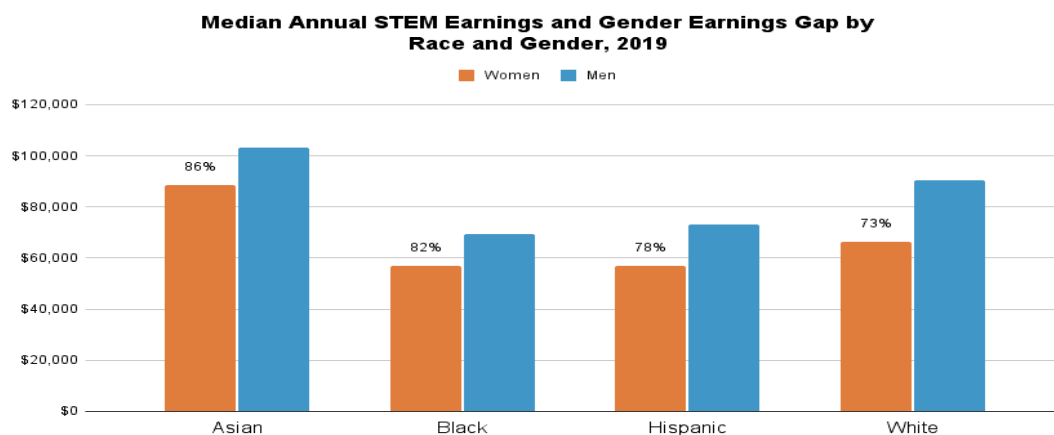
who can guide and encourage them in STEM pathways. Without supportive faculty or professional role models, many women struggle to navigate both academic and career obstacles. Further research shows that mentor gender disparities matter—mentees of women mentors, who themselves often have fewer resources or prestige, face greater challenges in advancing to leadership positions, sustaining a cycle of underrepresentation [\[24\]](#).

V. Gender Pay Gap in STEM and Leadership

Despite growing participation in STEM, women continue to face significant wage disparities compared to men. Even when qualifications and roles are equal, women are often paid less, promoted more slowly, and excluded from leadership pipelines. This persistent gap is shaped by multiple factors, including occupational segregation, biased evaluation systems, and a lack of transparency in pay structures. Countries like the UK and Poland have taken steps to address these inequalities. In the UK, the WISE Campaign works to inspire and support women in STEM through mentorship, policy advocacy, and workplace inclusion strategies. However, challenges remain: the UK has one of the highest gender wage gaps in Europe (14%) and offers only five STEM roles per 1,000 female workers [\[25\]](#). In Poland, the Perspektywy Education Foundation runs national campaigns such as Girls Go Science! and Girls as Engineers!, which introduce STEM pathways to high school girls. These efforts have helped increase female enrollment in technical universities from 29% to 37%, showing that targeted outreach can make a measurable impact [\[26\]](#). On the international level, several frameworks aim to close the gender pay gap. The ILO's Equal Remuneration Convention (C100), adopted in 1951, promotes equal pay for work of equal value. As of 2022, 174 out of 187 ILO member states have ratified it. The OECD reports that 18 countries require employers to report gender pay gaps, and 9 mandate pay equity audits to expose and correct wage disparities [\[27\]](#). The EU's Pay Transparency Directive, effective from June 2023,

requires salary ranges in job postings, bans salary history questions, and mandates reporting for companies with 100+ employees. If the gender pay gap exceeds 5%, a corrective action plan is required [\[27\]](#).

No matter the differences in race, nationality, or discipline, there remains a consistent gap between male and female earnings in STEM. As shown in the graph below, women engineers in the United States earn less than their male colleagues. [\[28\]](#).



Graph Title: U.S. Earnings Gap in Engineering Roles Source: Society of Women Engineers (SWE), 2025 [\[31\]](#)

These efforts mark important steps toward equity, but progress remains uneven. Closing the gender pay gap in STEM will require stronger enforcement, cultural change, and sustained investment in women's career development.

VI. Current Data, Global Trends, and Statistics

A. STEM Workforce and Academic Representation

Women in STEM work across diverse fields, and while representation varies by discipline, their impact is undeniable. According to recent data, life sciences have achieved near gender parity, while engineering and computing remain the least represented fields for women [\[28\]](#).

The She Figures 2021 report shows that less than a third of undergraduate students in science and engineering in the EU are women (31.3%). While the proportion of women slightly increases among PhD graduates (38%), the gender gap widens at senior levels, with women holding only 17.9% of full professorship positions in engineering and technology [31].

https://research-and-innovation.ec.europa.eu/statistics/she-figures_en

In 2023, a UN report found that women made up only 35% of STEM graduates and just 22% of the STEM workforce in G20 countries [32]. The Society of Women Engineers (SWE) reports that as of 2024, women made up 28.2% of the global STEM workforce, yet only one-third of those women hold research positions [30].

B. Global STEM Graduate Trends

A comparative report identified China, India, the United States, Russia, Iran, Indonesia, and Japan as the top seven STEM graduate-producing countries. However, by 2020, Brazil and Mexico had surpassed Iran and Japan in STEM graduate numbers. Brazil's number of graduates grew by 26%, and Mexico's by 30%, showing that new players are emerging in global STEM education [33].

In Asia, countries like China, India, Japan, and South Korea have seen rapid growth in STEM graduates over the past 50 years. These trends reflect both population size and national investment in science and technology education.

C. Women in STEM Leadership

The remarkable achievements of women in STEM fields have not only contributed to scientific and technological progress, but have



also enabled them to emerge as influential leaders, particularly as CEOs in STEM-driven industries. This is vital for combining technical proficiency with strategic leadership to shape the future.

As of 2025, approximately 17% of tech companies have a woman serving as CEO. However, women hold only 10–11% of executive or senior management roles globally. In 2022, women in tech leadership peaked at 14%, but overall averages remain low [\[29\]](#).

D. Notable Figures in STEM

- Dr. Katherine Johnson (NASA): Her orbital mechanics calculations were essential to the Apollo 11 moon landing, breaking both racial and gender barriers [\[28\]](#).
- Dr. Tu Youyou (China Academy of Traditional Chinese Medicine): Discovered artemisinin, a life-saving anti-malarial drug, earning her a Nobel Prize and reshaping global health [\[28\]](#).
- Rosalind Franklin (King's College London): Her X-ray crystallography work revealed the double helix structure of DNA, a foundational breakthrough in molecular biology [\[28\]](#).

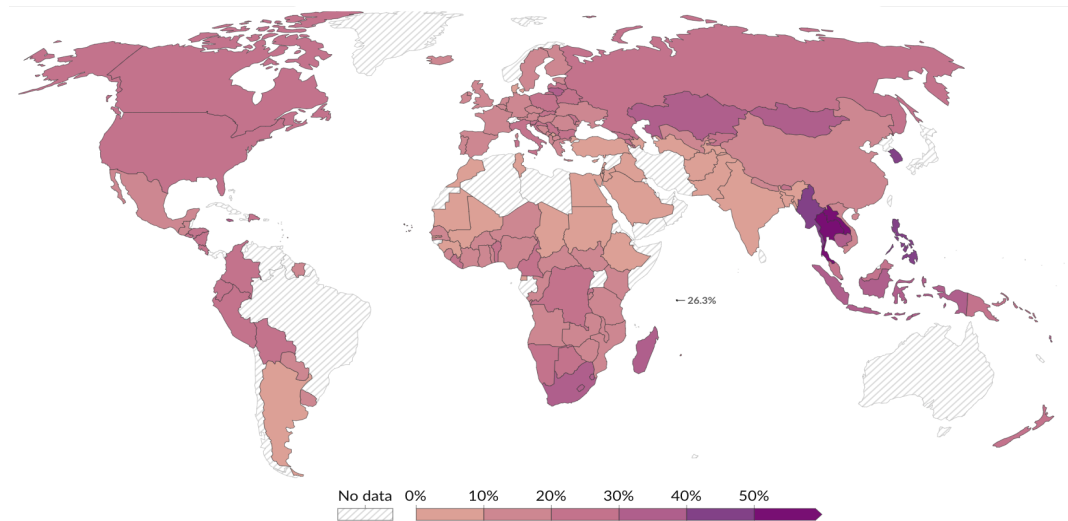
E. Regional Trends in Female Leadership

The country you live in can significantly shape your opportunities — especially for women.

A global map from Our World in Data shows that Thailand leads in the share of firms with top female managers, followed by Cambodia and Laos. In contrast, African regions show declining percentages, and Latin America's legislative efforts have yet to fully close the gap.

For example, Argentina's 2018 Gender Equality Bill aimed to improve salary, benefits, work-life balance, and childcare access, but its impact remains limited. Today, 12% of businesses in Latin America have no senior management roles held by women, and 17% have

only one. The EU shows similar figures: 9% of businesses have no female leaders, and 17% have just one woman in senior management [34].



Map Title: Share of Firms with Top Female Manager Source: Our World in Data [34]

F. Country Spotlights

- **Thailand:** In 2015, Thailand passed a gender equality law that treats gender-based discrimination as a crime. Despite lacking formal quotas, cultural respect for female leadership — rooted in historical figures like Si Suriyothai — has helped normalize women in management. Today, women hold 30–40% of leadership roles in both public and private sectors [35].
- **Philippines:** The 2009 Magna Carta of Women laid the foundation for gender equality in the workforce. While it doesn't mandate quotas, it promotes inclusive workplace policies. According to Grant Thornton's Women in Business report, the Philippines had the highest global share of women in senior management in 2021 — at 48% [36]. This reflects a cultural legacy of female leadership dating back to pre-colonial times.

VII. Public, Media, and Political Reactions

This topic covers so much space in daily life, we can see it clearly in our devices too. Even in this area girls and young women face lower digital skills and access, restricting entry to tech pathways. UNICEF highlights that in low income countries, up to 90% of girls 15-24 are offline, underscoring urgent equity gaps. Although an underdeveloped community is trying to remove women, there is so much support. [\[37\]](#) International Day of Women and Girls in Science (11 Feb) mobilizes institutions and the public each year, and some of movements online:

- #GirlsInICT (ITU) engages governments, schools, and companies; over 377,000 girls participated in 11,400+ events in 171 countries since 2011.
- #GenerationEquality; This is the flagship multi-generational campaign spearheaded by UN Women to mark the 25th anniversary of the Beijing Platform for Action. It calls for collective global action to advance women's rights and gender equality. The campaign launched with the Generation Equality Forum in Mexico City and Paris (2021), unveiling a five-year Global Acceleration Plan, with six Action Coalitions and a Global Compact on Women, Peace, Security, and Humanitarian Action. Over 2,500 commitments and more than \$50 billion have been pledged toward gender equality. [\[OBJ\]](#) [\[OBJ\]](#)



- #HeForShe; Launched by UN Women with the support of Goodwill Ambassador Emma Watson in 2014, this campaign invited men and boys worldwide to join the fight for gender equality. Within just two weeks of launch, there were around 1.1 million #HeForShe tweets, from over 750,000 users. The campaign rapidly became symbolic of male allyship in gender advocacy. [OBJ]



- #HearHerStory; Hosted by the UN Women Regional Office for Europe and Central Asia, this campaign forms part of the global “16 Days of Activism Against Gender-Based Violence” (Nov 25–Dec 10). #HearHerStory empowers survivors to share their experiences, aiming to dismantle stereotypes and victim-blaming. It leverages storytelling to inform policy and interventions, and is also used as a data collection tool to map trends in gender-based violence. [OBJ]

Also there is a UN-wide mobilization: Generation Equality provides toolkits and “action packs” for public campaigning and social media engagement across themes (including STEM, leadership, and ending violence). [39]

Of course there is the side that refuses. Women, especially in public life, face gendered disinformation and online violence, which chills participation and leadership. UN Women and partners flag this as a barrier to equality in digital spaces central to STEM.

Public discourse, especially on social platforms shapes norms, mobilizes supporters, pressures decision-makers, and can either open or shrink civic space for women and girls. UN

system research shows online spaces can both amplify gender-equality campaigns at scale and facilitate technology-facilitated gender-based violence (TFGBV) that chills women's participation in public life ,including politics and journalism.

- UNFPA #bodyright (digital-violence awareness)

A social movement and creative 'bodyright' mark that invites users to label images and posts, turning personal sharing into mass awareness and policy pressure about dignity and bodily autonomy online.

- Generation Equality

A multi-stakeholder initiative that couples narrative change with concrete, trackable commitments driving public engagement and accountability cycles across social channels and events.

- #JournalistsToo (UNESCO/OHCHR collaboration)

Research-driven advocacy that pairs data visualizations, testimonies, and shareable content to rally public support for women journalists safety online and offline demonstrating how evidence and storytelling can move Member States discussions. [OBJ]

- UNiTE - “Orange the World” (16 Days of Activism) [38]

Annual, global UN campaign coordinating governments, civil society, and individuals to spotlight and act on ending violence against women and girls.



Toolkits, message guides, and calls to action are designed for rapid social media uptake by schools, cities, and NGOs.

These hashtag campaigns matter because of:

- **Mobilization and visibility:** Each hashtag amplifies voices, whether through emotional storytelling, demands for justice, or public commitments and facilitates global solidarity.
- **Policy Influence:** Campaigns like #HearHerStory and #NiUnaMenos informs policymaking by spotlighting systemic failures and demanding accountability.
- **Inclusive Narratives:** Initiatives such as #HeForShe invite male engagement, while #GenerationEquality mobilizes youth and multigenerational participation.
- **Cross-Sector Collaboration:** Campaigns often integrate civil society, UN agencies, and media to broaden reach and impact.

And there is a rebound of this situation in politics. At a time when the global gender gap in innovation and tech remains stubbornly wide, targeted statements by leaders and policy measures, especially when backed by resources and accountability, can shift public narratives, inspire media coverage, and unlock pathways for real inclusion. Highlighting who says what and which governments back it with concrete action ensures clarity, accountability, and momentum in turning words into structural change. Statements by political leaders:

- **United Nations (Secretary-General António Guterres):** At the opening of the Commission on the Status of Women, he stressed that “girls and women make up just one-third of students in science, technology, engineering and mathematics,” and called for women’s “full participation and leadership in science and technology, from governments to board rooms and classrooms.” ^[40]

- Sima Bahous (UN Women Executive Director): Highlighted that the “digital divide has become the new face of gender inequality,” underscoring how lack of internet access and online harassment exclude women from educational and professional opportunities in STEM. [OBJ]
- Katarzyna Wawiernia (UNDP Resident Representative in Kazakhstan): At a leadership programme in Astana, she declared: “Women are underrepresented in STEM not only in Kazakhstan but globally... This leadership programme underscores our commitment to ensure sustainable development for all.” [OBJ]
- Helen Clark (Former Prime Minister of New Zealand & UNDP Administrator): At the same event, she emphasized: “Algorithms and artificial intelligence shape our world... this is a profound gender equality issue... Women must have equal access to these fields.”

Measures by governments and organizations:

- Australia, Department of Industry, Science, Energy and Resources: Committed A\$ 6.7 million of government funding (in 2022) to expand programs promoting women in STEM, aligned with the UN-celebrated International Day of Women and Girls in Science. [41] [OBJ]
- European Union: Requires research institutions to have a Gender Equality Plan in place to be eligible for Horizon Europe funding—and in 2022 awarded EUR 50,000 grants to female innovators under 35. [OBJ] [42]
- Ireland, Ministry of Further and Higher Education, Research, Innovation and Science (Minister Simon Harris): Announced that the three largest scientific funding bodies in Ireland now require higher education institutions to hold gender equality accreditation as a prerequisite for research funding. [OBJ] [43]

- UNDP-OECD Regional Initiative (Kazakhstan, funded by Japan & coordinated with UN Women): Organized a Leadership Programme for Women in STEM in Astana (Dec 2024), bringing together young women to develop leadership skills, mentorship and networking—directly addressing systemic underrepresentation (only 8–15% of engineering students in Kazakhstan are women). [\[44\]](#)

VIII. Case Studies

A. Dr. Kamala Sohonie

Dr. Kamala Sohonie, a biochemist born on June 18, 1911, in Bombay, was the daughter and niece of distinguished chemists who inspired her to pursue higher education. She later graduated with a BSc degree in chemistry and physics from the University of Bombay. After graduation, she applied to the master's program at IISc Bangalore. Despite being at the top of her class and meeting the requirements, she was rejected by the director, Dr. C. V. Raman, a Nobel Laureate who openly did not want women in his program for no apparent reason other than their gender.



Sohonie did not accept being rejected based solely on social prejudices or misogynistic views; she challenged his decision by doing a Gandhian-style dharna, a peaceful type of protest tied to Gandhian beliefs, in front of his office and demanding reasons why she was turned down. Eventually, Raman would let her in for a year under probation with very obviously biased limitations. She could only pass when Raman himself was satisfied with it; she would only be allowed to work at night, and perhaps the most outrageous of all, she was told not to draw attention to herself just to avoid distracting her male colleagues.

She accepted all the conditions and, a year later, submitted her research on staple food groups in India, which earned her an MSc. She was also offered a scholarship by Cambridge University to continue her Ph.D., and following Sohoni's success, Raman started to allow women to pursue higher education at IISc.

She would later become the first Indian woman to obtain a Ph.D. in science in 1939 and influence the whole industry with her discoveries and studies. After studying the diets of less wealthy groups in India, she discovered that palm trees, which were widespread across the country, were rich in important vitamins and minerals. This research was crucial for later creating affordable, nutritious and accessible food for people across India.

She sadly passed away in 1998 at the age of 86, just a year after winning the National Award for Excellence and Contribution to Science. Although she passed, she left behind much priceless knowledge, publications and her legacy, continuing to inspire countless women to this day. [\[45\]](#)



B. Dr. Rosalind Franklin

Dr. Rosalind Franklin was a brilliant British chemist and X-ray crystallographer who played a pivotal role in understanding DNA. Born into a distinguished family of scholars who placed great value on education and saw her gift for science at a young age, they supported her education through her early years. She went on to study at Newnham College in Cambridge, continuing her education even amidst the chaos of WWII. [\[46\]](#)

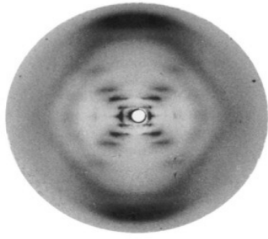


Photo 51

After earning her Ph.D. in Paris, she joined King's College London in 1951 to continue her studies. There, she used X-ray crystallography, capturing the famed "**Photograph 51**," which revealed the helical structure of DNA and would become crucial to understanding more about the structure of DNA, perhaps one of the most important developments in the 20th century. [\[47\]](#)

Despite her groundbreaking work and efforts, Maurice Wilkins, a colleague of Franklin, showed her work to James Watson and Francis Crick without her knowledge. They later developed a DNA model using her study, and Franklin was not given any credit for many years, even after her death. In 1962, they even callously shared the Nobel Prize in Physiology or Medicine. Franklin had already passed away from ovarian cancer four years before receiving the prize, and never got the recognition she deserved for many years. [\[46\]](#)

Franklin did not let this affect her and stayed committed to science for all her life. She left King's College and moved on to Birkbeck College, where she led important studies on viruses. Her dedication and hard work inspired countless women and still do today. Now, she is not only celebrated as a scientist but also as a symbol of the fight for gender equality in STEM.

C. Dr. Canan Dağdeviren

Dr. Canan Dağdeviren, born in İstanbul, Türkiye, on May 4th 1985, is a scientist recognised globally for her incredible work in material sciences and medical technology. She was inspired to pursue science at an early age. After completing her early education, she



graduated from Hacettepe University's Department of Physics Engineering in 2007 and earned her master's degree in Materials Science and Engineering at Sabancı University in 2009. She then went on with her Ph.D. at the University of Illinois. [\[48\]](#)

There, she focused on developing different foldable and flexible medical equipment, such as flexible mechanical energy harvesters, multi-functional cardiac vessel stents, wearable blood pressure sensors, and stretchable skin modulus sensing bio-patches. In 2014, she became the first Turkish person to become a Junior Fellow of Harvard. She won many awards and has been mentioned in magazines many times, such as in 2015 when MIT Technology Review named her among the "Top 35 Innovators Under 35", and Forbes magazine selected her as one of the "Top 30 Under 30 in Science". She currently leads the "Conformable Decoders" research group at MIT. [\[49\]](#)

Although she is young, she has made remarkable contributions to the medical and scientific industries and is sure to continue to do so. Today, she is giving hope to both heart and Parkinson's disease patients and young women across the world to dream big. She shows women can shine too, even in male-dominated fields and that they are just as capable as men. [\[48\]](#)

IX. The Role of Governments, NGOs, and the Private Sector

When it comes to supporting women's participation in professional and STEM fields, different groups play important roles in making that happen, and some that come to mind first are governments, NGOs, and the private sector. Governments can create national, regional and international laws and regulations that create equal education opportunities for everyone and more inclusive and safer workplaces. NGOs and civil society groups often work directly with those needing mentorship, training, and role models when the efforts of schools or

governments may not be enough. The private sector can create opportunities by funding programs, offering internships, and adjusting their workplace environments to better accommodate women and support them in advancing in their careers. Together, these groups make sure women are also included and supported.

A. Governments & National Regulations

- **APEC Women in STEM Principles and Actions:** APEC (Asia-Pacific Economic Cooperation) Women in STEM Principles and Actions are a set of principles, or pathways, specifically aimed at increasing women's participation in STEM fields. These principles and actions include providing scholarships, collecting data on gender balance, and funding education programs that make STEM more accessible to everyone and anyone. By setting these standards, governments can ensure that more women have both the education and the opportunities to enter scientific fields.[\[49\]](#)
- **EU Pay Transparency Directive (2023):** EU Pay Transparency Directive is a law created to ensure that women are paid fairly in contrast to men. It states that companies must share information about salaries and pay ranges, letting employees check for gaps and question their salaries. In addition, bigger companies must also regularly report on gender pay gaps and take action to correct such gaps. Because STEM industries and professional settings are mostly male-dominated, this law helps women in tech, science, and overall just professional environments earn the pay they deserve. Since it's binding, meaning all EU countries must follow it, it increases its impact.[\[50\]](#)
- **Women in Digital Strategy & Digital Decade Goals (2030):** This ongoing EU policy roadmap aims to increase women's participation and leadership in digital settings and specifically ICT (Information and Communication Technology) fields. Improving education policies to reduce gender bias in schools, creating educational

programs for girls and women to give them the opportunity to gain or refine digital skills and encouraging governments, private companies, and communities to work together to create more inclusive digital environments are just a small part of these goals. These are aimed at ensuring long-term progress in reducing gender gaps in STEM fields by setting clear goals for 2030. [\[51\]](#)

B. Civil society and NGO initiatives

- **Girls Who Code:** Girls Who Code is an international nonprofit that creates after-school clubs, summer programs, and college loops focused on computer science. They have already reached countless girls, and their alumni are five times more likely than the national average person to major in computer science. Girls Who Code also partners with corporations and big companies to connect students with mentors and find them career opportunities. [\[52\]](#)
- **W.TEC (Nigeria):** W.TEC is a nonprofit organisation which aims to close the gender gap in ICT fields by providing training, mentorship, and advocacy programs for women and girls. They provide digital skill training within camps and workshops so women and girls can use technology for work, activism and networking. Their work has been recognised globally and they keep on expanding their reach. [\[53\]](#)
- **INWES:** INWES (International Network of Women Engineers and Scientists) is a global network supported by UNESCO that connects organisations aiming to support women in STEM fields across 60+ countries, bringing engineers and scientists together all over the world. It was founded to ensure that women and girls fully participate in all fields of STEM. They hold conferences, meetings, and develop

projects to work towards their goal of “Building a better future worldwide through full and effective participation of women and girls in all aspects of Science, Technology, Engineering, and Mathematics (STEM).”[\[54\]](#)

C. Corporate & Private Sector Programs

- **Women Techmakers:** This program, created by Google, offers resources to women aiming to advance in their careers. They organise workshops, conferences and community groups with their members. With over 2000 ambassadors and 80000 members, they help women in STEM and ICT fields find and connect with each other in such male-dominated fields. [\[55\]](#)
- **Code First Girls:** Code First Girls is an organisation which provides free coding courses to women and non-binary people all across the world. They work with 130+ companies to help women find jobs through free education. Their goal is to help one million people learn coding and get jobs in the next 5 years. By providing such resources, they get one step closer to their mission of closing the gender gap in tech every day. [\[56\]](#)



Women Techmakers

X. UN Actions and International Agreements

The United Nations has been working towards creating gender equality and empowering women for decades now. To achieve these, many treaties, conventions and frameworks have been created. These documents have contributed to liberating, empowering and ensuring

women's safety immensely. The following are some key UN documents that have specifically helped women get equal pay and get started or progress in STEM fields.

- **CEDAW (Convention on the Elimination of All Forms of Discrimination against Women) (1979):**

Adopted by the UN in 1979, CEDAW was one of the most important and earliest steps taken towards achieving equal pay and motivating more women to step into STEM fields. This treaty calls on governments to end discrimination against women in education and professional life. [\[57\]](#)

- **Beijing Declaration and Platform for Action (1995):**

Organised by the UN, with CSW monitoring its progress, this declaration highlighted education and the economy as priority areas. It encouraged governments to expand opportunities for women in science and technology. [\[58\]](#)

- **CSW55 Agreed Conclusions (2011):**

This session was CSW's most important session towards ensuring women's participation in STEM fields. It focused specifically on access to education, training, science, and technology. It called for governments to eliminate barriers and support women's participation in STEM careers. [\[59\]](#)

- **2030 Agenda and SDG 5 (2015):**

Adopted by the UN General Assembly along with 16 other Sustainable Development Goals, this goal aims for equal opportunities in leadership and education, including professional and STEM fields. Creating a solid foundation for what governments and the UN should work towards. [60]



XI . Further Reading and Recommended Resources

1. **Women in STEM: Perceptions vs. Realities**

An in-depth article examining the challenges and misconceptions faced by women in STEM fields, offering insights into the realities of their experiences.

<https://swe.org/magazine/women-in-stem-perceptions-vs-realities/>

2. **The Gender Gap in STEM: Still Gaping in 2023**

A comprehensive analysis highlighting the persistent gender disparities in STEM fields and discussing strategies to bridge the gap.

<https://professionalprograms.mit.edu/blog/leadership/the-gender-gap-in-stem/>

3. Framework for Equitable Opportunities to Learn in STEM

A detailed framework proposing characteristics and entry points for creating equitable learning opportunities in STEM education.

https://ies.ed.gov/ncee/rel/regions/northeast/pdf/Framework_Equitable_Opportunities_STEM.pdf

4. Equity and Social Justice in STEM Education (Podcast)

Dr. Tatiane Russo-Tait discusses the importance of equity and social justice in STEM education, sharing insights from her research and experiences.

<https://teachinginhighered.com/podcast/equity-and-social-justice-in-stem-education/>

5. Intersectionality, Power, and Pedagogy (Podcast)

Clarissa Sorensen Unruh explores the concepts of intersectionality and power in pedagogy, offering perspectives on inclusive teaching practices.

<https://teachinginhighered.com/podcast/intersectionality-power-and-pedagogy/>

6. Designing for Justice (Podcast)

Rajiv Jhangiani shares reflections on designing educational experiences that promote justice and inclusivity.

<https://teachinginhighered.com/podcast/designing-for-justice/>

7. Equity in STEM: Empowering Global Under-Represented Communities (Video)

A discussion on initiatives aimed at empowering underrepresented communities in STEM, focusing on challenges and strategies for inclusion.

<https://www.youtube.com/watch?v=cpl6m2frsbQ>

8. Advancing Gender Equality in STEM Industries (Video)

An exploration of strategies to increase female participation and leadership in STEM industries, addressing barriers and solutions.

<https://www.youtube.com/watch?v=a3sNxeoDpcM>

9. Retaining Women in STEM (Video)

Nicole Cabana discusses the challenges faced by women in STEM and provides ideas for how to address them, focusing on retention strategies.

<https://www.youtube.com/watch?v=aHVfQTH6EcU>

10. The Question Guy Podcast: Equality in STEM Education and Industry (Video/Podcast)

Dr. Poh Tan discusses strategies for promoting equality in STEM education and industry, focusing on leadership and systemic change.

<https://www.youtube.com/watch?v=-U-d97tJAdw>

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