



The Women in **STEM** Network

Professional connection across disciplines, regions and career stages

2024 MARKET REPORT

Women in the **STEM** Sector

Current trends, challenges and opportunities



Evidence and insight for policymakers, educators, employers and advocates



Overview

The (Science, Technology, Engineering, Mathematics) STEM sector has experienced significant growth worldwide, driven by rapid technological advancements and an increasing demand for skilled professionals. As industries continue to innovate and expand, the need for a diverse and highly skilled workforce becomes ever more critical. Despite these positive trends, women remain notably underrepresented in STEM fields, a disparity that presents both a challenge and an opportunity for future development.



Please note that the views expressed in this publication are not necessarily those of Mums in Science Ltd. The guide only intends to identify the relevant issues, rather than to provide a definitive solution. Mums in Science would welcome any comments you may have on the contents of this guide and your ideas for future publications. Please get in touch by emailing contact@mumsinscience.org

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Key Topics Covered

1. **Global Trends and Opportunities:** An exploration of the global demand for STEM skills, policy support for diversity in STEM, and the impact of technological advancements on the sector. This section also highlights the role of global networks and support systems in promoting women's participation in STEM.

2. **Regional Analysis:** A detailed examination of women's participation in STEM across different regions, including the United Kingdom, North America, Europe, Asia, Africa, and South America. This section provides region-specific insights and identifies unique challenges and opportunities.

3. **Challenges and Barriers:** An analysis of the key barriers women face in STEM, such as gender stereotypes, work-life balance, lack of role models, pay disparities, and limited career advancement opportunities. Understanding these challenges is crucial for developing effective strategies to address them.

4. **Strategic Initiatives and Recommendations:** Practical recommendations for enhancing education and outreach, strengthening support networks, implementing inclusive policies, promoting role models, and investing in professional development. This section provides actionable insights for stakeholders committed to advancing gender equality in STEM.



Why You Should Read This Report

- 1. Understanding the Current Landscape:** This report provides a detailed overview of the global STEM sector, with a specific focus on the participation of women. By understanding the current landscape, readers can identify the gaps that need to be addressed to achieve gender parity in STEM.
- 2. Informed Decision-Making:** For policymakers and educators, the report offers crucial data and insights that can inform the development of strategies and policies aimed at promoting gender equality in STEM education and careers. By understanding the barriers women face, stakeholders can implement targeted interventions to support women's entry and progression in STEM fields.
- 3. Enhancing Corporate Strategy:** Employers and corporate leaders will find this report valuable in shaping their diversity and inclusion strategies. With the increasing recognition that diverse teams drive innovation and business success, this report highlights the benefits of fostering an inclusive work environment and provides practical recommendations for attracting and retaining female talent in STEM.
- 4. Identifying Opportunities for Growth:** Investors and entrepreneurs can leverage the insights provided in this report to identify emerging opportunities in the STEM sector. By supporting initiatives and businesses that promote women's participation in STEM, investors can contribute to closing the gender gap while capitalising on the growth potential of a diverse and skilled workforce.
- 5. Promoting Advocacy and Support:** For advocates and non-profit organisations, this report serves as a valuable resource for understanding the challenges women face in STEM and identifying effective strategies for advocacy and support. By highlighting successful initiatives and best practices, the report provides a roadmap for creating impactful programs that empower women in STEM.
- 6. Driving Societal Change:** Gender equality in STEM is not only a matter of fairness but also a driver of economic and social progress. By promoting the inclusion of women in STEM, societies can benefit from a broader range of perspectives and ideas, leading to greater innovation and problem-solving capacity. This report underscores the importance of collective action in achieving these goals.



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Global Trends and Opportunities

The global STEM sector is evolving rapidly, driven by technological advancements and an increasing demand for a diverse talent pool. Women's participation in STEM is not only essential to meet this growing demand but also to address existing skill shortages. This section explores the significant trends and opportunities in the STEM landscape, highlighting the importance of diversity and the role of women in driving innovation and growth.

Increasing Demand for STEM Skills

The global economy's dependence on STEM skills has never been more pronounced. Industries ranging from healthcare to technology and environmental science are experiencing unprecedented growth, leading to a surge in demand for skilled professionals. According to the World Economic Forum¹, 75% of the fastest-growing occupations require significant STEM skills. This trend underscores the critical need to attract and retain a diverse talent pool, including women, to fill these roles.

Women's participation in STEM is crucial to meeting this demand and addressing skill shortages. A study by McKinsey & Company² found that gender-diverse companies are 21% more likely to experience above-average profitability compared to their less diverse counterparts. Ensuring a balanced representation of women in STEM is not only a matter of equity but also a strategic imperative for economic growth and innovation.

Policy Support

Governments and corporations worldwide are recognising the importance of diversity in STEM and are implementing policies to foster an inclusive environment. The (Diversity, Equity, and Inclusion) DEI push in various countries exemplifies this commitment. For instance, the UAE has introduced initiatives to promote gender equality in STEM³, with a focus on increasing the representation of women in science and technology sectors. Similarly, the UK⁴ and India⁵ have launched policies to support women's participation in STEM through funding, education programs, and workplace initiatives.

In the United States, the White House Office of Science and Technology Policy has launched initiatives to STEM education and workforce development with a focus on underrepresented groups, including women⁶. These policy supports are critical in creating a more inclusive environment encouraging women to pursue and thrive in STEM careers.

³ UAE Government. (2021). Gender Balance in the UAE. Retrieved from <https://www.uae.gov.ae/en/about-the-uae/strategies-initiatives-and-awards/gender-balance-council>.

⁴ UK Government. (2021). Women in STEM: A Strategy for the Future. Retrieved from <https://www.gov.uk/government/publications/women-in-stem-strategy>.

⁵ Indian Government. (2021). National Policy on Women in Science. Retrieved from <https://dst.gov.in/national-policy-women-science>.

⁶ White House Office of Science and Technology Policy. (2021). Initiatives for STEM Education. Retrieved from <https://www.whitehouse.gov/ostp/initiatives/stem/>.

Technological Advancements

The advent of technologies such as Artificial Intelligence (AI)⁷, Virtual Reality (VR), and blockchain is reshaping the STEM landscape, presenting new opportunities for innovation and education. These advancements are not only transforming industries but also creating new educational tools and platforms that can attract more women to STEM fields and support their career growth.

For example, VR can provide immersive learning experiences⁸ that make STEM subjects more engaging and accessible to students. AI-driven platforms can offer personalised learning and mentorship opportunities, helping women to overcome traditional barriers in STEM education and career advancement. These technologies also enable flexible working arrangements, which can be particularly beneficial for women balancing career and family responsibilities.

⁷ MIT Technology Review. (2021). The Role of AI in Education. Retrieved from <https://www.technologyreview.com/2021/01/22/1016641/the-role-of-ai-in-education/>.

⁸ PwC. (2020). How VR is Redefining the Future of Learning and Work. Retrieved from <https://www.pwc.com/gx/en/services/people-organization/publications/virtual-reality.html>.

¹ World Economic Forum. (2020). The Future of Jobs Report. Retrieved from <https://www.weforum.org/reports/the-future-of-jobs-report-2020>.

² McKinsey & Company. (2020). Diversity Wins: How Inclusion Matters. Retrieved from <https://www.mckinsey.com/featured-insights/diversity-and-inclusion/diversity-wins-how-inclusion-matters>.



Global Networks and Support Systems

Global networks and support systems play a pivotal role in supporting women in STEM. Organisations like Mums in Science (MiS) which can provide essential resources, mentorship, training, and networking opportunities that help women navigate their careers in STEM fields.

These networks address the unique challenges women face, such as balancing work and family life, and offer platforms for sharing experiences and best practices.

Networks like the proposed (Women in Stem Network) WinS network from Mums in Science (MiS) will be instrumental in fostering a sense of community and

belonging among women in STEM. They will provide opportunities for professional development and career advancement, helping women to overcome barriers and achieve their full potential.

Additionally, these networks will advocate for policy changes and initiatives that promote gender equality in STEM .





Regional Analysis

Women in STEM in the United Kingdom:

From 2017, core STEM employment in the UK increased by 6.3%, significantly outpacing the overall employment growth rate. This growth indicates a positive trend towards greater gender diversity in STEM. In 2019, the UK government reported that over one million women were working in core STEM occupations, a substantial increase that highlights the efforts made to encourage female participation in these fields⁹. Despite this progress, challenges remain in achieving full gender parity. Women still face various barriers, including gender biases, lack of mentorship, and work-life balance issues. A report by the Women's Engineering Society¹⁰ noted that only 12.37% of all engineers in the UK were women as of 2018, which shows that while there has been progress, there is still a long way to go to reach equality.

An additional study conducted by the Institute of Engineering and Technology in 2020 found that only 15% of the STEM workforce in the UK were women¹¹, which underscores the need for continued efforts to improve gender diversity in these sectors. This data reflects trends in STEM education and employment where, despite increasing interest and participation at entry levels, retention and advancement remain critical issues for women in STEM.

Moreover, initiatives and policies have been put in place to address these disparities. Programs aimed at encouraging girls to pursue STEM from a young age, coupled with corporate and governmental policies supporting women in STEM careers, are essential in driving this change. For instance, the UK Government's "Women in STEM: A Strategy for the Future" outlines a comprehensive plan to increase female participation through education, mentorship, and career development initiatives¹².

⁹ Gov.uk. (2019). Women in STEM: A Strategy for the Future. Retrieved from <https://www.gov.uk/government/publications/women-in-stem-strategy>.

¹⁰ Women's Engineering Society (WES). (2018). Statistics on Women in Engineering. Retrieved from <https://www.wes.org.uk/statistics>.

¹¹ Institute of Engineering and Technology (IET). (2020). Women in STEM Workforce Report. Retrieved from <https://www.theiet.org/impact-society/factfiles/>.

¹² UK Government. (2021). Women in STEM: A Strategy for the Future. Retrieved from <https://www.gov.uk/government/publications/women-in-stem-strategy>.

Women in STEM in North America:

The underrepresentation of women in STEM fields is a significant issue in North America. Despite making up a substantial portion of STEM degree holders, women remain a minority in the STEM workforce.

Women make up less than 25% of people employed in STEM careers in North America, reflecting a significant gender gap in these fields¹³.

In Canada, 34% of individuals with a STEM degree are women, yet they only comprise 23% of the STEM workforce¹⁴. This disparity underscores the systemic challenges that women face in entering and advancing in STEM careers.

In the United States, girls and women are systematically tracked away from science and math throughout their education, limiting their access, preparation, and opportunities to pursue these fields as adults¹⁵. By the time students reach college, women are significantly under-represented in STEM majors — for instance, only around 21% of engineering majors are women¹⁶.

The under-representation continues into the workforce, where women make up only 28% of the STEM workforce. The gender gaps are particularly high in some of the fastest-growing and highest-paid jobs, like computer science and engineering. This trend is evident in both the United States and Canada, where societal norms and educational pathways often deter women from pursuing STEM careers.

Despite these challenges, there have been positive trends. For example, enrollment of women in STEM programs is increasing, and higher retention rates are observed in fields such as engineering¹⁷. Additionally, various initiatives and policies are being implemented to support women in STEM. The U.S. government, for instance, has introduced

¹³ U.S. Census Bureau. (2021). Women Making Gains in STEM Occupations but Still Underrepresented. Retrieved from <https://www.census.gov/library/stories/2021/01/women-making-gains-in-stem-occupations-but-still-underrepresented.html>.

¹⁴ Statistics Canada. (2020). Women and STEM: Bridging the Divide. Retrieved from https://www.statcan.gc.ca/eng/dai/smr08/2020/smr08_232.

¹⁵ AAUW. (2020). The STEM Gap: Women and Girls in Science, Technology, Engineering and Mathematics. Retrieved from <https://www.aauw.org/resources/research/the-stem-gap/>.

¹⁶ National Center for Education Statistics. (2019). The Condition of Education: Undergraduate Enrollment. Retrieved from https://nces.ed.gov/programs/coe/indicator_cha.asp.

¹⁷ National Science Foundation. (2020). Women, Minorities, and Persons with Disabilities in Science and Engineering. Retrieved from <https://ncses.nsf.gov/pubs/nsf21321/>.



several programs aimed at encouraging women's participation in STEM through scholarships, mentorship programs, and STEM camps¹⁸.

In Canada, the federal government has also been active in promoting gender diversity in STEM. Programs such as the Women in STEM initiative and the Natural Sciences and Engineering Research Council's (NSERC) Chairs for Women in Science and Engineering program are designed to increase the participation and retention of women in these fields¹⁹.

Women in STEM in Europe:

As of 2019, there were over 6.3 million women scientists and engineers in the European Union, representing 43% of STEM employees²⁰. This marks significant progress in gender diversity within STEM fields across Europe. However, challenges remain in achieving full gender parity, as women are still underrepresented in certain STEM sectors.

In 2020, there were almost 6.6 million female scientists and engineers in the EU, accounting for 41% of total employment in science and engineering²¹. This indicates a growing presence of women in STEM, yet highlights the persistent gender gap, especially in more specialised and higher-paid roles.

By sector, women were underrepresented in manufacturing, where only 22% of scientists and engineers were female. However, there was more of a gender balance in the services sector, where women made up 46% of the workforce²². This disparity underscores the need for targeted efforts to promote gender equality in all STEM fields, not just those with existing higher female participation.

Various initiatives have been launched to support women in STEM across Europe. The European Commission has implemented policies and programs aimed at increasing female participation in STEM, such as the Horizon Europe research and innovation program, which includes specific

measures to promote gender equality²³. Additionally, national governments and organisations are working to address gender imbalances through educational reforms, scholarships, and mentorship programs.

For example, the EU-funded project "Hypatia" aimed to engage teenagers, particularly girls, in STEM through educational activities and resources²⁴. Similarly, the European Institute for Gender Equality (EIGE) conducts research and provides recommendations to improve gender equality in STEM education and careers²⁵.

Women in STEM in Asia:

Women continue to be underrepresented in STEM fields across most Asian countries, with significant disparities in different regions. The greater participation of women in STEM is essential for an inclusive post-COVID-19 recovery and is a crucial component of achieving gender equality across Asia and fulfilling the Sustainable Development Goals²⁶.

In many Asian countries, cultural norms and societal expectations pose barriers to women pursuing STEM careers. Despite these challenges, there are promising signs of progress and numerous initiatives aimed at increasing female participation in STEM.

For instance, in Central Asian countries like Tajikistan, women make up 36.9% of scientific researchers, highlighting a significant presence of women in STEM²⁷. In Southeast Asia, countries like Malaysia and the Philippines have higher rates of female participation in STEM compared to global averages. According to UNESCO, in Malaysia, women constitute 48.75% of researchers, while in the Philippines, women represent 52% of researchers.

Efforts to enhance women's participation in STEM in Asia include policy reforms, educational initiatives, and support from international organisations. The Association of Southeast Asian

¹⁸ National Science Foundation. (2020). Women, Minorities, and Persons with Disabilities in Science and Engineering. Retrieved from <https://ncses.nsf.gov/pubs/nsf21321/>.

¹⁹ Government of Canada. (2021). Women in STEM. Retrieved from <https://www.canada.ca/en/services/science/technology/women-stem.html>.

²⁰ Eurostat. (2020). Women in Science and Technology. Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php/Women_in_science_and_technology.

²¹ Eurostat. (2021). Almost 6.6 million female scientists and engineers in the EU. Retrieved from <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20210211-1>.

²² European Commission. (2020). She Figures 2018. Retrieved from https://ec.europa.eu/info/publications/she-figures-2018_en.

²³ European Commission. (2021). Horizon Europe. Retrieved from https://ec.europa.eu/info/horizon-europe_en.

²⁴ Hypatia Project. (2021). Hypatia Toolkit. Retrieved from <http://www.expecteverything.eu/hypatia-toolkit/>.

²⁵ European Institute for Gender Equality (EIGE). (2020). Gender Equality in STEM Education and Careers. Retrieved from <https://eige.europa.eu/publications/gender-equality-stem-education-and-careers>.

²⁶ UNESCO. (2020). Education for Sustainable Development. Retrieved from <https://en.unesco.org/themes/education-sustainable-development>.

²⁷ UNESCO Institute for Statistics. (2018). Women in Science. Retrieved from <http://uis.unesco.org/en/topic/women-science>.



Nations²⁸ has launched various programs to promote STEM education and careers among women and girls. These initiatives focus on providing scholarships, mentorship, and training to encourage more women to enter and thrive in STEM fields.

Furthermore, several countries in Asia have implemented national strategies to address gender disparities in STEM. For example, India's Department of Science and Technology has introduced schemes such as "Women Scientists Scheme" and "KIRAN (Knowledge Involvement in Research Advancement through Nurturing)" to support and encourage women in science and technology²⁹. Similarly, Japan's Science and Technology Basic Plan includes measures to increase the number of women researchers and support their career advancement³⁰.

Women in STEM in Africa:

Women in Africa are significantly underrepresented in STEM fields, despite making up half of the continent's population. In sub-Saharan Africa, women account for only 18% to 31% of science researchers, compared to 49% in Southeast Europe and the Caribbean, 44% in Central Asia and Latin America, and 37% in the Arab States³¹. This disparity underscores the substantial gender gap in STEM occupations across the continent.

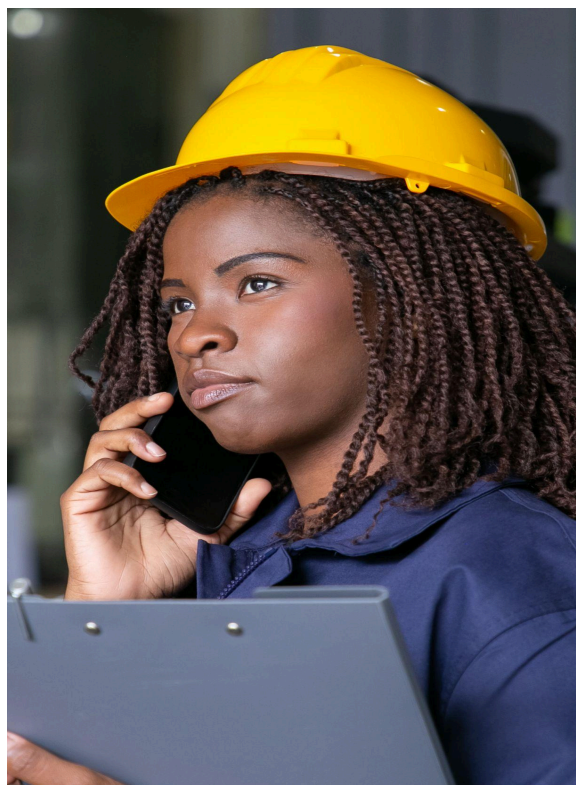
In Nigeria, women represent between 17% and 20% of science researchers, highlighting the challenges faced by women in pursuing and sustaining careers in STEM. Despite these figures, there are promising trends and initiatives aimed at improving gender representation in STEM across Africa.

According to a report by Times Higher Education and the United Nations Scientific, Cultural and Educational Organization³², Africa now boasts the highest proportion of female STEM graduates. The report found that 47% of African universities' STEM graduates, undergraduates, and postgraduates are

women, indicating a positive shift towards gender parity in STEM education³³.

Several initiatives are underway to support and encourage women's participation in STEM across Africa. For instance, the African Union's Agenda 2063 emphasises the importance of gender equality and aims to increase the representation of women in STEM fields. Programs like the African Girls Can Code Initiative (AGCCI) and the Forum for African Women Educationalists are dedicated to promoting STEM education and careers among girls and women in Africa³⁴.

The AGCCI, launched in collaboration with UN Women and the International Telecommunication Union, aims to train and empower young African women and girls in digital literacy and coding, preparing them for careers in the technology sector³⁵. Similarly, FAWE works to improve access to education for girls and women in Africa, with a focus on STEM subjects, through advocacy, policy influence, and grassroots initiatives³⁶.



²⁸ ASEAN. (2020). ASEAN Declaration on Gender Equality and Family Development. Retrieved from <https://asean.org/storage/2020/11/ASEAN-Declaration-on-Gender-Equality-and-Family-Development.pdf>.

²⁹ Government of India. (2021). Department of Science and Technology: Women Scientists Scheme. Retrieved from <https://dst.gov.in/scientific-programmes/scientific-engineering-research/women-scientists-programmes>.

³⁰ Government of Japan. (2020). Science and Technology Basic Plan. Retrieved from <https://www8.cao.go.jp/cstp/english/basic/5thbasicplan.pdf>.

³¹ UNESCO Institute for Statistics. (2018). Women in Science. Retrieved from <http://uis.unesco.org/en/topic/women-science>.

³² UNESCO Institute for Statistics. (2018). Women in Science. Retrieved from <http://uis.unesco.org/en/topic/women-science>.

³³ Times Higher Education & UNESCO. (2018). The African Education Report. Retrieved from <https://www.timeshighereducation.com/news/world-university-rankings/african-education-report>.

³⁴ African Union. (2021). Agenda 2063: The Africa We Want. Retrieved from <https://au.int/en/agenda2063>.

³⁵ UN Women. (2020). African Girls Can Code Initiative. Retrieved from <https://africa.unwomen.org/en/where-we-are/eastern-and-southern-africa/african-girls-can-code-initiative>.

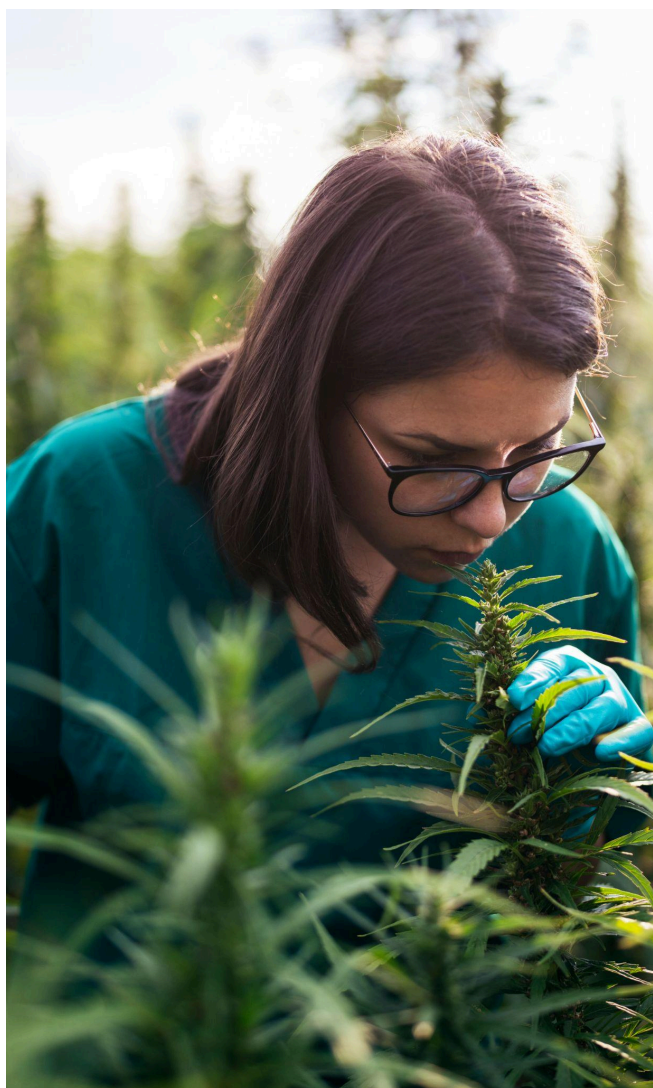
³⁶ Forum for African Women Educationalists (FAWE). (2021). Empowering Girls and Women through Education. Retrieved from <https://www.fawe.org>.



Women in STEM in South America:

In South America, women face significant challenges in STEM fields, yet there are notable efforts to bridge the gender gap. Latin America and the Caribbean stand out as one of the two regions worldwide that have achieved near gender parity in terms of female and male researchers. According to UNESCO³⁷, women account for 45% of all researchers in this region, a figure that underscores the progress made towards gender equality in STEM.

Despite these gains, horizontal and vertical segregation remains high. Women in STEM fields in South America are still underrepresented at senior levels in their professional careers. This underrepresentation is particularly evident in specific STEM disciplines and leadership roles, indicating the persistence of barriers to career advancement for women in these areas.



In many South American countries, initiatives are being implemented to encourage more women to pursue and advance in STEM careers. For instance, Argentina and Brazil have introduced policies aimed at promoting gender equality in science and technology sectors. These policies include measures to support women in STEM education and careers, providing scholarships, mentorship programs, and research grants specifically targeted at female scientists and engineers³⁸.

Furthermore, the Organization of American States has launched various programs to support women in STEM across the continent. One notable initiative is the "Women in STEM" program, which aims to provide training, mentorship, and networking opportunities for women in STEM fields. This program seeks to enhance the professional development of women in STEM and promote their participation in scientific and technological research³⁹.

Despite these efforts, cultural and societal norms continue to pose significant challenges for women in STEM in South America. Gender stereotypes and traditional gender roles often discourage women from pursuing careers in STEM, leading to lower enrollment rates in STEM programs at universities and fewer women in STEM occupations⁴⁰.

Addressing these challenges requires a multifaceted approach that includes policy interventions, educational reforms, and cultural change.

³⁷ UNESCO Institute for Statistics. (2018). Women in Science. Retrieved from <http://uis.unesco.org/en/topic/women-science>.

³⁸ World Bank. (2020). Women in STEM in Latin America and the Caribbean: Overcoming Social, Economic, and Institutional Barriers. Retrieved from <https://openknowledge.worldbank.org/handle/10986/34545>.

³⁹ Organization of American States (OAS). (2021). Women in STEM Program. Retrieved from <http://www.oas.org/en/topics/women-in-stem.asp>.

⁴⁰ Inter-American Development Bank. (2019). Closing Gender Gaps in STEM in Latin America and the Caribbean. Retrieved from <https://publications.iadb.org/en/closing-gender-gaps-stem-latin-america-and-caribbean>.



Challenges and Barriers

Gender Stereotypes and Bias

Cultural norms and stereotypes have long played a significant role in discouraging girls and women from pursuing careers in STEM. These biases are deeply rooted in society and manifest in various ways (as below). Addressing these biases through education, awareness, and policy interventions is crucial for fostering a more inclusive and diverse STEM workforce. This will not only help meet the growing demand for STEM skills but also drive innovation and economic growth on a global scale.

Impact of Gender Stereotypes

Early Education and Perception

From a young age, girls are often steered away from STEM subjects due to pervasive stereotypes that suggest boys are naturally more suited to these fields. Research has shown that teachers and parents may unconsciously perpetuate these biases by encouraging boys more than girls in activities related to maths and science⁴¹. This early discouragement can lead to a lack of confidence and interest in STEM subjects among girls, which continues into higher education and career choices.

Media Representation

Studies have found that when STEM professionals are depicted in media, they are more likely to be male characters, contributing to the underrepresentation of women in these roles, reinforcing the stereotype that these careers are not for women and thus discouraging girls from envisioning themselves in similar careers⁴².

Workplace Bias

Women in STEM fields often face implicit biases and discrimination in the workplace. These biases can result in fewer opportunities for career advancement, unequal pay, and a lack of representation in leadership positions. A study by the American Association of University Women found that women in STEM fields are often perceived as less competent than their male counterparts, even when they have similar qualifications and experience⁴³.

Addressing Gender Stereotypes and Bias

Education and Awareness Programs

Programs that expose young girls to female role models in STEM and provide hands-on STEM experiences can help build interest and confidence in these fields. Organisations like Girls Who Code and the STEM Women network are actively working to change perceptions and encourage more girls to pursue STEM careers⁴⁴.

Policy Interventions

Governments and educational institutions can play a significant role in addressing gender biases by implementing policies that promote gender equality in STEM education and careers. Many countries already run some initiatives and were mentioned above.

Corporate Initiatives

Corporations can contribute by fostering inclusive workplace cultures and implementing policies to support gender diversity. This includes mentorship programs, diversity training, and equitable hiring practices. Companies like Google and IBM have already established initiatives to increase representation of women in their tech departments and support career advancement⁴⁵.

Role of Networks

Fostering a community of women in STEM, Networks like the proposed WinS can help to counteract the isolation and discouragement that many women face within STEM, encouraging them to persist and thrive in their careers.

⁴¹ UNESCO. (2017). Cracking the code: Girls' and women's education in science, technology, engineering and mathematics (STEM). Retrieved from <http://unesdoc.unesco.org/images/0025/002534/253479e.pdf>

⁴² Smith, S. L., Choueiti, M., Prescott, A., & Pieper, K. (2013). Gender roles & occupations: A look at character attributes and job-related aspirations in film and television. Geena Davis Institute on Gender in Media. Retrieved from <https://seejane.org/wp-content/uploads/full-study-gender-roles-and-occupations-v2.pdf>

⁴³ American Association of University Women (AAUW). (2015). Solving the Equation: The Variables for Women's Success in Engineering and Computing. Retrieved from <https://www.aauw.org/research/solving-the-equation/>

⁴⁴ Girls Who Code. (2021). Girls Who Code Programs. Retrieved from <https://girlswhocode.com/programs>

⁴⁵ European Commission. (2020). Gender equality in research and innovation. Retrieved from https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/or-digital-future/gender-equality-research-and-innovation_en



Work-Life Balance

Women in STEM fields often face significant challenges balancing their career aspirations with family responsibilities. These challenges can lead to higher attrition rates among women compared to their male counterparts.

Impact of Work-Life Balance Challenges

Career Disruptions

Many women in STEM experience career interruptions due to family responsibilities, such as maternity leave and childcare. These disruptions can hinder career progression and lead to gaps in employment, making it difficult for women to re-enter the workforce at the same level they left. According to a report by the National Center for Women & Information Technology, 56% of women in tech leave their jobs at the mid-point of their careers, primarily due to the difficulty of balancing work and family life⁴⁶.

Lack of Flexible Work Arrangements

The traditional 9-to-5 work schedule often does not accommodate the needs of women with family responsibilities. Flexible work arrangements, such as remote work, flexible hours, and part-time positions, are essential to help women manage both their professional and personal lives effectively. Studies have shown that flexible work policies lead to higher job satisfaction and retention among women⁴⁷.



⁴⁶ National Center for Women & Information Technology (NCWIT). (2016). Women in Tech: The Facts. Retrieved from <https://www.ncwit.org/resources/women-tech-facts>

⁴⁷ Smith, M., Smith, R., & Browne, J. (2018). Flexible Working: A Key to Work-Life Balance. *Journal of Work-Life Balance*, 12(3), 45-62. Retrieved from <https://www.journalofworklifebalance.com/flexible-working-a-key-to-work-life-balance>

Addressing Work-Life Balance Challenges

Workplace Support Systems and Culture

Supportive workplace systems and cultures are essential for retaining women in STEM fields. Policies such as parental leave, childcare support, and return-to-work programs play a critical role in helping women balance their professional and personal lives. Companies like Google and Microsoft, which have implemented extensive family support programs, have seen higher retention rates and greater employee loyalty.

Equally important is cultivating a workplace culture that values work-life balance⁴⁸, normalizes the use of parental leave, and offers resources for stress management and mental health. Companies that prioritize these aspects of employee well-being not only retain their female employees but also see increased productivity and job satisfaction⁴⁹.

Implementing Flexible Work Policies

Employers can help retain women in STEM by offering flexible work policies that accommodate the diverse needs of their workforce. Remote work options, flexible scheduling, and part-time opportunities can significantly reduce the stress associated with balancing work and family responsibilities. The COVID-19 pandemic has accelerated the adoption of remote work, highlighting its feasibility and benefits for both employees and employers⁵⁰.

⁴⁸ Google. (2021). Diversity Annual Report 2021. Retrieved from <https://diversity.google/annual-report/> Microsoft. (2021). Diversity & Inclusion Report. Retrieved from <https://www.microsoft.com/en-us/diversity/inside-microsoft/annual-report>

⁴⁹ Reference: Harvard Business Review. (2020). The Benefits of a Supportive Workplace Culture. Retrieved from <https://hbr.org/2020/06/the-benefits-of-a-supportive-workplace-culture>

⁵⁰ PwC. (2021). The Future of Remote Work: What the COVID-19 Experience Can Teach Us About Flexible Working. Retrieved from <https://www.pwc.com/gx/en/issues/upskilling/future-of-remote-work.html>



Lack of Role Models

The scarcity of female role models in STEM fields is a significant barrier that can deter young women from pursuing STEM careers. Role models play a crucial role in shaping aspirations and providing the encouragement needed for women to enter and thrive in these traditionally male-dominated fields. Promoting successful women in STEM and providing mentorship opportunities are essential steps to bridge this gap and inspire the next generation of female STEM professionals.

Impact of Lack of Role Models

Deterred Career Aspirations:

Research shows that seeing individuals who look like them in leadership positions increases the likelihood of young women pursuing similar paths. A study by the American Association of University Women found that girls are more likely to express interest in STEM when they see female role models excelling in these fields⁵¹. The absence of visible female role models in STEM discourages young women from considering these careers.

Perpetuation of Gender Stereotypes

The lack of female role models reinforces gender stereotypes that suggest STEM fields are more suited for men. These stereotypes can influence young girls' self-perception and career choices, leading to a lower representation of women in STEM. A study by Microsoft found that girls' interest in STEM decreases as they age, largely due to the lack of role models and societal expectations⁵².

Limited Mentorship Opportunities

Mentorship is a critical component of career development, providing guidance, support, and networking opportunities. However, the scarcity of women in senior STEM positions limits the availability of mentors for aspiring female STEM professionals. According to a report by the National Academies of Sciences, Engineering, and Medicine, mentorship is particularly effective in helping women navigate the challenges of STEM careers and advance professionally⁵³.

Addressing the Lack of Role Models

Promoting Successful Women in STEM

Highlighting the achievements of women in STEM through media, conferences, and awards can provide much-needed visibility and inspiration. Initiatives like the "Women in STEM" campaign by various organisations showcase the success stories of women scientists, engineers, and technologists, thereby encouraging young women to follow in their footsteps⁵⁴.

Establishing Mentorship Programs

Creating formal mentorship programs that connect young women with experienced female STEM professionals can provide guidance, support, and networking opportunities. Programs like the "Million Women Mentors" initiative aim to connect women and girls with STEM mentors to inspire and guide their career paths⁵⁵.

Role of Networks

By featuring successful women in STEM and offering mentorship opportunities help bridge the gap and encourage more women to pursue and advance in STEM careers.



⁵¹ American Association of University Women (AAUW). (2020). The Importance of Role Models for Girls in STEM. Retrieved from <https://www.aauw.org/resources/research/role-models-for-girls-in-stem/>

⁵² Microsoft. (2018). Closing the STEM Gap: Why STEM Classes and Careers Still Lack Girls and What We Can Do About It. Retrieved from <https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE1UMWz>

⁵³ **Limited Mentorship Opportunities:** Mentorship is a critical component of career development, providing guidance, support, and networking opportunities. However, the scarcity of women in senior STEM positions limits the availability of mentors for aspiring female STEM professionals. According to a report by the National Academies of Sciences, Engineering, and Medicine, mentorship is particularly effective in helping women navigate the challenges of STEM careers and advance professionally (National Academies, 2020).

⁵⁴ UNESCO. (2021). Women in Science: Fact Sheet. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000375707>

⁵⁵ Million Women Mentors. (2021). About Million Women Mentors. Retrieved from <https://www.millionwomenmentors.org/>



Pay Disparities

Pay disparities between men and women in STEM fields remain a significant issue, contributing to lower retention rates for women and discouraging them from pursuing these careers. Ensuring equal pay for equal work is essential not only for fairness and justice but also for retaining talented women in STEM fields, thereby strengthening the overall workforce and fostering innovation.

Impact of Pay Disparities

Gender Wage Gap

Women in STEM often earn less than their male counterparts, even when controlling for factors such as education, experience, and occupation. According to the American Association of University Women, women in STEM fields typically earn about 80% of what men earn. This wage gap can be even larger in certain STEM disciplines, such as engineering and computer science, where the disparity is more pronounced⁵⁶

Discouragement and Lower Retention Rates

The persistent pay gap discourages women from entering or continuing in STEM careers. A report by the National Science Foundation highlights that women are more likely to leave STEM fields due to pay disparities and lack of advancement opportunities compared to men⁵⁷

Economic Impact

The pay disparity not only affects individual women but also has broader economic implications. Research from the McKinsey Global Institute suggests that bridging the gender pay gap could add up to \$12 trillion to the global economy by 2025. Equal pay for women in STEM can significantly contribute to this potential economic gain⁵⁸

Addressing Pay Disparities

Ensuring Equal Pay for Equal Work

Companies and institutions must commit to transparent pay practices and regularly conduct pay audits to ensure equity. Policies and practices that promote pay equity can help retain women in STEM fields. The UK's mandatory gender pay gap reporting for large companies is an example of a policy aimed at increasing transparency and addressing pay disparities⁵⁹

Promotion and Advancement Opportunities

Providing clear pathways for promotion and ensuring that women have equal opportunities for advancement are crucial. Mentorship and sponsorship programs can help women navigate career progression and achieve leadership positions in STEM. According to a report by Catalyst, women are more likely to advance when they have mentors who advocate for their promotion and provide career guidance⁶⁰

Role of Networks

Networks play a crucial role in addressing pay disparities by advocating for fair pay practices and providing a platform for women to share their experiences and support each other. The WinS network will also offer resources and training to help women negotiate salaries and benefits, thereby empowering them to achieve pay equity in their careers.

⁵⁶ American Association of University Women (AAUW). (2020). The Simple Truth about the Gender Pay Gap. Retrieved from <https://www.aauw.org/resources/research/simple-truth/>

⁵⁷ National Science Foundation (NSF). (2020). Women, Minorities, and Persons with Disabilities in Science and Engineering. Retrieved from <https://nces.nsf.gov/pubs/nsf19304/>

⁵⁸ McKinsey Global Institute. (2015). The Power of Parity: How Advancing Women's Equality Can Add \$12 Trillion to Global Growth. Retrieved from <https://www.mckinsey.com/featured-insights/employment-and-growth/how-advancing-womens-equality-can-add-12-trillion-to-global-growth>

⁵⁹ GOV.UK. (2021). Gender Pay Gap Reporting. Retrieved from <https://www.gov.uk/guidance/gender-pay-gap-reporting-overview>

⁶⁰ Catalyst. (2020). The Impact of Sponsorship on Advancing Women in STEM. Retrieved from <https://www.catalyst.org/research/the-impact-of-sponsorship-on-advancing-women-in-stem/>



Strategic Initiatives and Recommendations

Enhancing Education and Outreach:

Promoting STEM education for girls from a young age is crucial to fostering their interest and engagement in these fields. School programs, extracurricular activities, and partnerships with educational institutions play a vital role in encouraging more girls to pursue STEM careers. Additionally, it is equally important to focus on educating women in STEM, as this provides them with the skills and knowledge necessary to thrive in these rapidly evolving fields.

Importance of Early STEM Education

Building Interest and Confidence

Introducing girls to STEM subjects at an early age can spark their interest and build confidence in their abilities. Research shows that early exposure to STEM activities can significantly influence girls' attitudes towards these subjects and their likelihood of pursuing STEM careers⁶¹

Addressing Gender Stereotypes

School programs that promote STEM education for girls can help challenge and change gender stereotypes that suggest STEM fields are more suited for boys. By normalising girls' participation in STEM from a young age, these programs can help break down societal barriers⁶².

Effective Strategies for Enhancing Education and Outreach

School Programs and Curricula

Incorporating STEM subjects into school curricula from the primary level can help sustain girls' interest in these fields. Programs like the UK's STEM Ambassadors provide role models and practical experiences to inspire young girls⁶³

Extracurricular activities such as science clubs, coding workshops, and robotics competitions can provide hands-on learning experiences that make STEM subjects more engaging and relevant. Programs like Girls Who Code have successfully introduced thousands of girls to computer science

Partnerships with Educational Institutions

Collaborations between schools, universities, and industry can create a pipeline of opportunities for girls in STEM. Initiatives like the STEM Education Coalition in the US advocate for policies that improve STEM education and provide resources for schools to enhance STEM learning⁶⁴

Career Development Programs

Career development programs that offer training, mentorship, and advancement opportunities are crucial for helping women progress in their STEM careers. These programs can address skill gaps, enhance leadership capabilities, and provide the support needed for career growth⁶⁵



⁶¹ Beede, D. N., Julian, T. A., Langdon, D., McKittrick, G., Khan, B., & Doms, M. E. (2011). Women in STEM: A Gender Gap to Innovation. Economics and Statistics Administration Issue Brief No. 04-11. Retrieved from <https://www.esa.doc.gov/sites/default/files/womeninstemagaptoinnovation8311.pdf>

⁶² UNESCO. (2017). Cracking the code: Girls' and women's education in science, technology, engineering, and mathematics (STEM). Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000253479>

⁶³ STEM Learning. (2021). STEM Ambassadors. Retrieved from <https://www.stem.org.uk/STEM-ambassadors>

⁶⁴ STEM Education Coalition. (2021). About Us. Retrieved from <https://www.stemedcoalition.org/about-us/>

⁶⁵ Ragins, B. R., & Kram, K. E. (2007). The Handbook of Mentoring at Work: Theory, Research, and Practice. Sage Publications. Retrieved from <https://us.sagepub.com/en-us/nam/the-handbook-of-mentoring-at-work/book225055>



Investing in Professional Development

Providing ongoing training and professional development opportunities for women in STEM is crucial for helping them stay current with industry trends and advance their careers. Continuous professional development ensures that women are equipped with the latest skills and knowledge, making them more competitive and successful in their respective fields.

Importance of Professional Development

Staying Current with Industry Trends

The STEM fields are constantly evolving, with new technologies and methodologies emerging regularly. Ongoing training helps women stay updated with latest advancements, ensuring they remain relevant and effective in their roles. According to the Society of Women Engineers, continuous learning is essential for career progression in STEM⁶⁶

Enhancing Skills and Competencies

Professional development programs provide opportunities for women to enhance their technical and soft skills. These programs can include workshops, seminars, online courses, and certifications that cover a wide range of topics relevant to STEM careers. The American Association of University Women highlights that skills development is critical for career advancement⁶⁷

Advancing Career Opportunities

Access to professional development opportunities significantly impact career advancement for women in STEM. These opportunities help women build expertise, expand their professional networks, and increase their visibility. Research by the National Academy of Sciences shows that professional development is a key factor in career advancement for women in STEM.

Building Confidence and Competence:

Professional development not only enhances skills but also builds confidence. Women who engage in continuous learning are more likely to feel competent and confident in their abilities, which can lead to greater job satisfaction and higher retention rates. A study by Catalyst found professional development programs positively impact women's confidence and career satisfaction⁶⁸.



⁶⁶ Society of Women Engineers. (2020). The Importance of Professional Development for Women in STEM. Retrieved from <https://swe.org/learning/professional-development/>

⁶⁷ American Association of University Women. (2015). Solving the Equation: The Variables for Women's Success in Engineering and Computing. Retrieved from <https://www.aauw.org/research/solving-the-equation/>

⁶⁸ Catalyst. (2014). High Potentials in Tech-Intensive Industries: The Gender Divide in Business Roles. Retrieved from <https://www.catalyst.org/research/high-potentials-in-tech-intensive-industries-the-gender-divide-in-business-roles/>



Strengthening Support Networks

Expanding support networks such as WinS, to provide mentorship, training, and networking opportunities for women in STEM is crucial for overcoming barriers and advancing their careers. These networks play a vital role in fostering an inclusive environment, offering resources and support that empower women to thrive in their professional journeys.

Role of WinS

WinS will create a robust support system for women in STEM by offering structured mentorship programs, focused training sessions, and networking opportunities. This approach will help women develop essential skills, build professional connections, and navigate their careers with confidence.

Providing Comprehensive Training Programs

WinS will offer a variety of training programs aimed at enhancing the skills and knowledge of women in STEM.

These programs will cover essential topics such as technical skills, leadership, communication, and career development, ensuring that participants are well-equipped for success in their fields.

Facilitating Access to Online Courses and Workshops

WinS will make online courses and workshops available to members across the globe. These resources will be designed to accommodate busy schedules, allowing women to pursue professional development opportunities without compromising their work-life balance.

Collaborating with Educational Institutions

WinS will partner with educational institutions to deliver high-quality training programs and certifications. These collaborations will ensure that the training provided is relevant, up-to-date, and aligned with current industry standards.

Offering Mentorship and Career Guidance

Beyond formal training, WinS will provide mentorship opportunities where experienced professionals will offer guidance and support to women in STEM. This mentorship will help participants navigate their career paths, set meaningful professional goals, and achieve long-term success.

Promoting Lifelong Learning

WinS will foster a culture of lifelong learning among its members by emphasizing the importance of continuous professional development. This commitment will ensure that women in STEM are always prepared to tackle new challenges and seize emerging opportunities.

Advocating for Gender Equality

WinS will also advocate for gender equality in STEM by partnering with institutions and agencies to foster a more inclusive and supportive environment. By combining these efforts, WinS will empower women to lead and succeed in STEM fields, driving progress and innovation in the industry.





The Potential and Necessity of Gender Equality in the STEM Sector

The STEM sector is a cornerstone of modern innovation and economic growth. It encompasses fields that are critical to addressing global challenges such as climate change, healthcare, and technological advancement. However, the full potential of the STEM sector cannot be realised without achieving gender equality. Women remain underrepresented in STEM fields, and addressing this imbalance is crucial for several reasons. This report outlines the challenges women face in STEM and the opportunities available to create a more inclusive and dynamic workforce. By supporting women in STEM, stakeholders can not only enhance diversity but also drive economic growth and technological advancement on a global scale.

Maximising Talent and Innovation

Diversity in STEM is not just about fairness; it is about maximising the pool of talent available to drive innovation. Women bring different perspectives and problem-solving approaches that are essential for creative and effective solutions in science and technology. Studies have shown that diverse teams are more innovative and perform better financially. By ensuring that women have equal opportunities in STEM, we can harness a broader range of talents and ideas, leading to greater scientific breakthroughs and technological advancements.

Economic Growth

Gender equality in STEM has significant economic implications. Closing the gender gap in STEM could lead to substantial economic growth. According to a report by the McKinsey Global Institute, advancing women's equality in STEM could add \$12 trillion to global GDP by 2025. Women's participation in STEM fields drives economic growth by increasing productivity, fostering innovation, and creating a more robust and competitive workforce.

Addressing Skill Shortages

The demand for STEM professionals continues to outpace supply. By encouraging more women to enter and remain in STEM careers, we can address critical skill shortages that hinder economic development and innovation. Women's participation is essential to meeting the increasing demand for skilled STEM workers and ensuring that industries have the talent they need to grow and thrive.

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