ACCELERATING WOMEN'S ADVANCEMENT IN STEM:

EMERGING LESSONS ON NETWORK STRATEGIES AND APPROACHES IN ASIA

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ACCELERATING WOMEN'S ADVANCEMENT IN STEM: EMERGING LESSONS ON NETWORK STRATEGIES AND APPROACHES IN ASIA

by Ellen Boccuzzi and Paula Uniacke on behalf of The Asia Foundation Women's Empowerment and Gender Equality Program

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EXECUTIVE SUMMARY

Networks, both formal and informal, play a pivotal role in helping girls and women enter and succeed in STEM fields. They do this by facilitating peer support, role models, mentorship and sponsorship, opportunities for technical and soft skills development, knowledge exchange and collaboration, visibility, and more. This Asia Foundation report showcases the diversity of networks working to advance women's participation and leadership in STEM in Southeast and East Asia, examines the successful – and often innovative – strategies these networks are using to achieve their missions, and highlights emerging lessons for developing, funding, and strengthening these networks.

The Asia Foundation's Women-in-STEM Network Mapping identifies over 70 networks working to support women to enter and advance in STEM careers in Asia. These networks differ in size, approach, geographic scope, and domain. Several prioritize the advancement of persons with disabilities in STEM fields or LGBTQ2+[i] individuals in STEM. The core missions, structures, and strategic approaches of these networks vary. Some tackle a specific barrier facing women in STEM, while others employ a lifecycle approach that offers adaptive support to women to address the range of barriers they confront as they progress through their education and careers. These include government and civil society networks at the local, national, regional, and global levels, as well as private sector associations within and across companies. Several companies support internal networks that create safe spaces for exchange on STEM careers, often as part of broader corporate Diversity, Equity, and Inclusion (DEI) strategies. The mapping also includes informal networks of colleagues or peers insofar as individual women access or leverage these networks to enter or advance in a STEM career.

The STEM networks analyzed in this report were drawn from the initial network mapping. They support women's entrance into and success within STEM fields primarily by addressing and breaking down the barriers that limit women's engagement in STEM. Barriers that women and girls in Asia experience to participating in STEM fields and STEM networks include gendered bias and discrimination; lack of female role models in STEM; cultural norms and gatekeepers that limit access to STEM education, careers, and networks; and workplace policies, including inadequate family leave policies and inflexible work schedules.

Women's STEM networks in Asia employ a range of strategies to address these barriers, including: creating safe spaces for women in STEM to discuss their needs; helping women build confidence in their abilities and vision for their career trajectories; making STEM affordable, approachable, and accessible to women; facilitating mentorship and network building; raising the visibility of women in STEM and creating role models; and supporting inclusive leadership and institutional change to expand access to STEM fields. Through these strategies, networks are supporting more

[i] LGBTQ2+ stands for lesbian, gay, bisexual, transgender, queer (or sometimes questioning), two-spirited, and other sexual orientations and gender identities.

girls and women to enter STEM education and employment and to advance in STEM careers.

The report also examines the key operational, programmatic, and structural limitations that women-in- STEM networks face as they work to bring more women into STEM fields and support women to advance in STEM careers. The primary challenge that networks face are financial and human resource constraints: these factors can limit the effectiveness and sustainability of networks and pose challenges for the management of successful networks if and when they scale. A lack of diversity within networks can also be a challenge, and a lost opportunity —particularly when it means that network members have limited access to powerholders. Networks also face a range of structural barriers that can limit their effectiveness: from public or corporate policies that make it difficult for networks to register or operate, to inadequate internet infrastructure, and to gender inequities in caring duties that make it less likely that women will have time to join, participate in, or lead networks.

“WOMEN’S NETWORKS HAVE REALLY HELPED TO ENCOURAGE AND PROPEL ME FORWARD IN MY CAREER.”

WENDY JOHNSTONE, CHIEF OPERATING OFFICER, ASIA PACIFIC, ZENDESK

Building on the successful network approaches identified through this research, and cognizant of the limitations that tend to circumscribe networks' effectiveness, this report captures emerging lessons for developing, funding, and fortifying networks and offers recommendations for strengthening the effectiveness and sustainability of women-in-STEM networks in Asia. Key recommendations for networks, private sector companies, and government include:

For networks:

- Develop a robust sustainability strategy, including a plan for financial and human resourcing
- Cultivate gatekeepers
- Make STEM affordable
- Actively promote diverse and inclusive network membership
- Leverage powerholders in the network and the network's collective identity for progress
- Encourage network members to participate in multiple, diverse networks
- Contribute to the creation of an association of women-in-STEM networks

For the private sector:

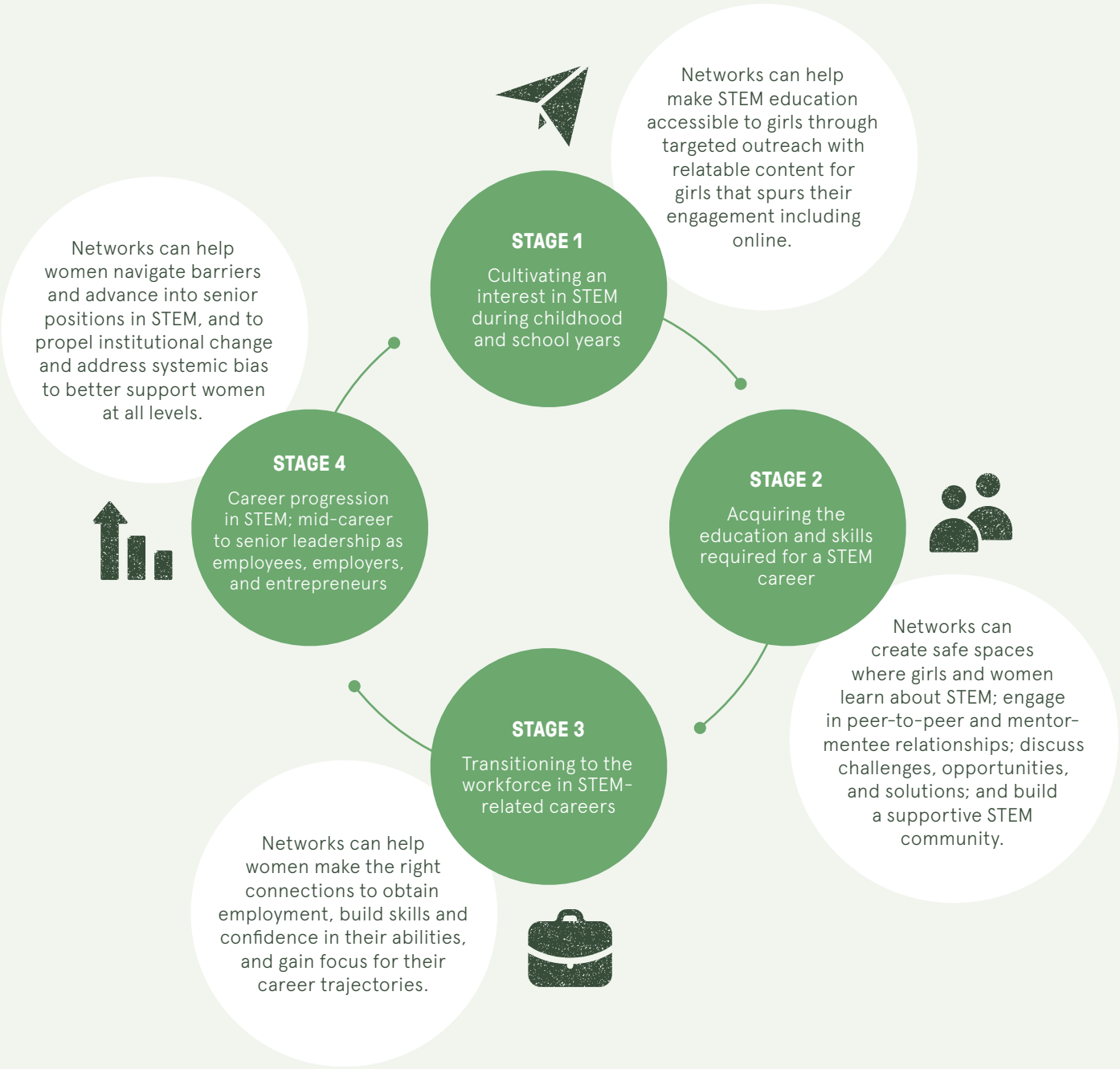
- Leverage women-in-STEM networks to drive institutional change
- Advance DEI goals through support for internal networks
- Create and formalize opportunities for staff to engage in networks, both internal and external
- Create work placement opportunities for STEM students and graduates
- Engage STEM networks to upskill employees
- Foster the development of an association of women-in-STEM networks and elevate its key initiatives

For government:

- Create a supportive enabling environment for network creation
- Partner with networks to expand the reach of government programs and policies
- Adopt policies that create an enabling environment for women's participation in STEM
- Catalyze the development of an association of women-in-STEM networks and fund its key initiatives

It is our hope that networks, the private sector, government, and civil society can use this research to identify approaches for working with and leveraging women-in-STEM networks in ways that help more women enter and succeed in STEM careers in Asia. We hope that you will draw inspiration from the work that is being undertaken by networks in Asia together with their allies and sponsors and support these efforts to close the STEM gender gap.

THE ASIA FOUNDATION'S LIFECYCLE APPROACH TO SUPPORTING GIRLS' AND WOMEN'S ADVANCEMENT IN STEM



INTRODUCTION

This report highlights an array of networks working to advance women's participation and leadership in STEM in East Asia and Southeast Asia and examines the successful – and often innovative – strategies these networks are using to achieve their missions, together with lessons learned on how to foster robust, sustainable networks.

For the purposes of this research, the researchers defined "women's STEM networks" to include both formal and informal networks that help women to enter and advance in STEM fields. These include government and civil society networks at the local, national, regional, and global levels, as well as private sector entities within and across companies. We also include informal networks of colleagues or peers insofar as individual women access or leverage these networks to enter or advance in a STEM career. The research also includes women whose jobs are highly reliant on tech, such as women in platform work,[ii] as "women in STEM."

The research grew out of the October 2020 Women's Leadership in STEM Virtual Summit, which was organized by The Asia Foundation, in partnership with the U.S. Department of State, on behalf of the governments of the United States, Japan, and the Republic of Korea. Summit participants identified STEM networks as critical for: supporting women's entrance into STEM fields and leadership within them; driving local solutions for STEM education; and fostering a space of sharing, learning, and collaboration. A key recommendation of Summit participants was further research on the ways in which women-in-STEM networks are improving broader outcomes for women in STEM fields in Asia.

WOMEN'S PARTICIPATION AND LEADERSHIP IN STEM ARE CRITICAL FOR ECONOMIC GROWTH AND DEVELOPMENT, AND ADVANCING GENDER EQUALITY

STEM fields[iii] are vital to the growth of Asian economies and, as such, the rising demand for STEM professionals necessitates an expansive talent pool. By the year 2030, as many as 80 percent of jobs in Southeast Asia will require workers with basic digital literacy as well as applied ICT skills.[1] To meet this need, it is essential to harness the skills, abilities, and perspectives of the full working population—not just the male half. For instance, Indonesia will face a shortage of 600,000 to 1.2 million technology, media, and telecommunication workers by 2030. This talent shortage could cost its economy $21.8 billion in unrealized economic output.[2] The gender gap in STEM has significant opportunity costs for companies and economies.[3] Currently, the Philippines is the only Asian country that ranks in the top 10 globally for closing the STEM gender gap.[4] While women comprise 52 percent of science and technology researchers in the Philippines,[5] only one-third of researchers in Indonesia and Singapore are women.[6] Moreover, in Japan and Korea, countries with high levels of technological sophistication, only 15 percent and 18 percent of researchers, respectively, are women.[7]

[ii] Platform work is a form of employment in which individuals or organizations use an online platform to provide services in exchange for payment.

[iii] Science, technology, engineering, and mathematics. In some cases, this is formulated as "STEMM," with the additional "M" standing for "Medicine," or "STEAM," with "A" standing for the arts.

A diverse workforce not only meets the demand for skilled workers but also results in better STEM innovation and development, more successful products, and even the availability of services that can save lives.[8] The inclusion of women's perspectives – including the perceptions of diverse women who represent racial or ethnic minorities, have a disability, or are LGBTQ2+ — is proven to boost creativity and mitigate implicit biases.[9] Diversity results in more dynamic, effective, and inclusive research, design, and commodities — and higher revenues. Boston Consulting Group (BCG) research has found that, globally, a more diverse workforce leads to 19 percent more innovation and 9 percent higher operating margins, and there is a correlation between a more diverse workforce and increased revenue from new products.[10] Increasing girls' and women's participation in STEM is also critical for realizing their social and economic rights, promoting better social and economic outcomes for families and communities, and achieving the Sustainable Development Goals (SDGs).[11] Participation in STEM enables women to contribute to and benefit from economic opportunities, products developed, and progress in solving global development challenges.[12]

NETWORKS SUPPORT WOMEN'S PARTICIPATION AND LEADERSHIP IN STEM.

Networks play a pivotal role in helping girls and women enter, succeed, and lead in STEM fields. They do this in myriad ways, with networks facilitating peer support, role models, mentorship and sponsorship,[iv] opportunities for technical and soft skills development, knowledge exchange and collaboration, heightened visibility, and other benefits.[13] The Asia Foundation's Women-in-STEM Network Mapping identified over 70 networks working to support women to enter and advance in STEM careers in Southeast and East Asia. These networks differ in size, approach, and geographic scope. The core missions, structures, and strategic approaches of these networks vary. Some tackle critical barriers facing women in STEM, while others employ a lifecycle approach that offers adaptive support to women as they progress through their education and careers. Some are organized around affinity groups (generally, groups of individuals with similar identity characteristics or priorities) to provide targeted support to specific groups such as those with disabilities or LGBTQ2+ individuals.[14]

COVID-19: CHALLENGES AND OPPORTUNITIES FOR WOMEN-IN-STEM NETWORKS.

The Covid-19 pandemic has underscored women's vital contributions to families, communities, workplaces, local and national economies, and countries, while exposing the challenges women face to workforce participation across Asia. Women have lost jobs or dropped out of the labor force at higher rates than men as they have struggled to manage increased paid and unpaid care work as well as a surge in gender-based violence across the region.[15] Policymakers call for greater attention to the need to place women at the center of the post-pandemic economic recovery, including supporting career pivots and re-entry programs that are vital to recovery efforts. Focused attention on women's economic participation offers an important opportunity to advance women's participation in STEM.

The Covid-19 pandemic has also created challenges for networks that traditionally operated through in-person engagement, while also opening a range of opportunities for these networks' expansion and diversification. Necessity led many of the networks profiled in this report to an all-online model during the pandemic. While this made it more difficult for members of affinity networks to develop the strong ties that derive from in-person interactions, it has also enabled these networks to reach much broader constituencies. By moving online, STEM networks are now reaching

[iv] Mentors are commonly viewed as sounding boards that provide support and encouragement and share knowledge and experience, while sponsors are active in opening doors and advocating for someone being considered for a key role or promotion.

women in remote islands of Indonesia and the Philippines with technical trainings and are also more accessible to women with disabilities and with caring and other duties, all of whom benefit from a more flexible training schedule (particularly when trainings are posted online for asynchronous use).

The broader shift to online business and learning has also created opportunities for women-in-STEM networks, and for women in general, to find new employment through the development of tech skills. For instance, as many brick-and-mortar businesses moved online, demand skyrocketed for website development and remote support positions. Programs and networks supporting women to reskill for tech careers have utilized this shift to bring more women into employment while increasing the sustainability of their own programs. Similarly, networks in the region have been able to leverage the shift to online schooling to train women for employment as remote science teachers. Finally, in cases where women experienced barriers to in-person employment, the pandemic has created opportunities for women in STEM by allowing them to engage in these careers from home. Networks across the region are leveraging these shifts to support women's entrance into new STEM careers.

IN SOUTHEAST ASIA, WOMEN'S NETWORKS HAVE BEEN CALLED "HIDDEN GEMS" FOR THEIR ABILITY TO BOOST THE NUMBER OF WOMEN STUDYING TECHNOLOGY.

SOURCE: BOSTON CONSULTING GROUP

It is our hope that networks, the private sector, government, and civil society can utilize this research to identify promising approaches for working with and leveraging women-in-STEM networks to help more women enter and succeed in STEM careers. There is an urgent need for government and the private sector to invest in and support STEM networks at this time, given the significant job losses and disruptions that women continue to experience during the Covid-19 pandemic. This report highlights successful cases and strategies from Asia-based organizations as well as exemplary global examples.


DOOSAN

RESEARCH METHODOLOGY

This research was designed to analyze network approaches and practices that are effective in increasing and sustaining women's participation and leadership in STEM education and careers in Southeast and East Asia; to identify barriers that these networks confront in achieving their mission; and to provide specific recommendations for strengthening their work in support of women's STEM leadership.

First, the Asia Foundation conducted a Women-in-STEM Network Mapping that identified over 70 networks committed to advancing gender equality and women's participation in STEM. The mapping includes information on each organization's mission, approach, size, demographics, and funding, as well as whether it operates locally (including within corporations or universities), nationally, regionally, or globally. The mapping was undertaken via a literature review, online research, and local outreach through the Foundation's offices in Southeast and East Asia. While the mapping is extensive, it is neither exhaustive nor representative. For instance, networks with only non-English online materials may have been overlooked.

Based on this mapping, 22 networks were selected for in-depth examination in this report based on the effective and/or innovative approaches they employ to support women's entrance into STEM education or careers and their advancement in STEM fields. Interviews were conducted with network founders, leaders, and members through a combination of key informant interviews (29) and focus group discussions (5). The report examines these successful strategies and approaches in depth so that readers may consider how best to leverage existing work and/or adapt it to their own contexts.

BARRIERS TO WOMEN'S PARTICIPATION IN STEM

The STEM networks showcased in this report support women's entrance into and success within STEM fields primarily by addressing and breaking down the barriers that limit women's engagement in STEM. This section provides an overview of the key obstacles women and girls face as a prelude to the in-depth discussion of network approaches in the Effective Network Approaches section below.

Women and girls face multiple and overlapping barriers at each stage of their STEM journeys, from early education to late career. In Asia and around the globe, these barriers are particularly daunting for those from under-resourced areas and from disadvantaged backgrounds, such as those with disabilities, from minority groups, or who are LGBTQ2+. These barriers are influenced by both formal and informal systemic and individual factors. Gendered social norms perpetuate the idea that men and boys are 'naturally' more adept at STEM and better suited for STEM careers than girls and women.[16] Gatekeepers and influencers – including parents, schools, and managers – can either exacerbate or help to alleviate these pressures.[17]

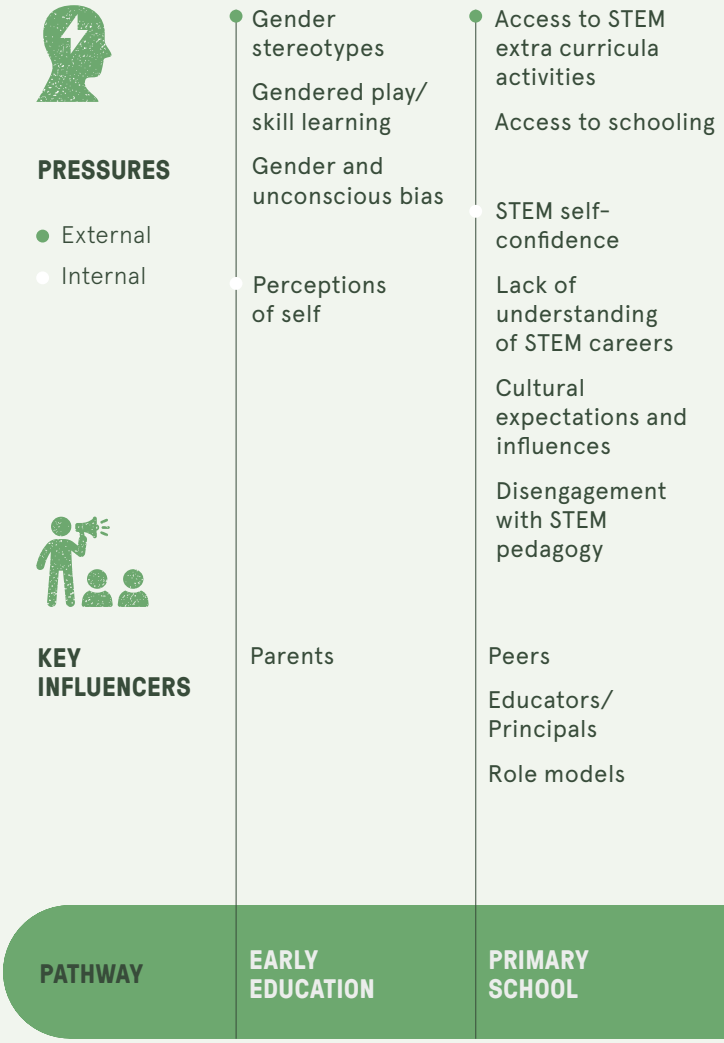
Gender bias, stereotypes, and a lack of female role models decreases the likelihood that girls can confidently picture themselves pursuing and excelling in STEM careers.[18] A 2020 study of Filipino girls demonstrated that loss of interest in STEM subjects began as early as the age of 10, as girls began perceiving STEM careers as male-dominated, and became convinced that girls are naturally less intelligent in STEM subjects; the relative lack of female STEM role models reinforced such perceptions.[19] When such barriers persist over the course of women's careers, they tend to diminish retention and advancement of women in STEM, particularly when they are coupled with gender-blind workplace or public policies, or with casual and systemic discrimination.

The Leaky Pipeline and The STEM Gender Gap

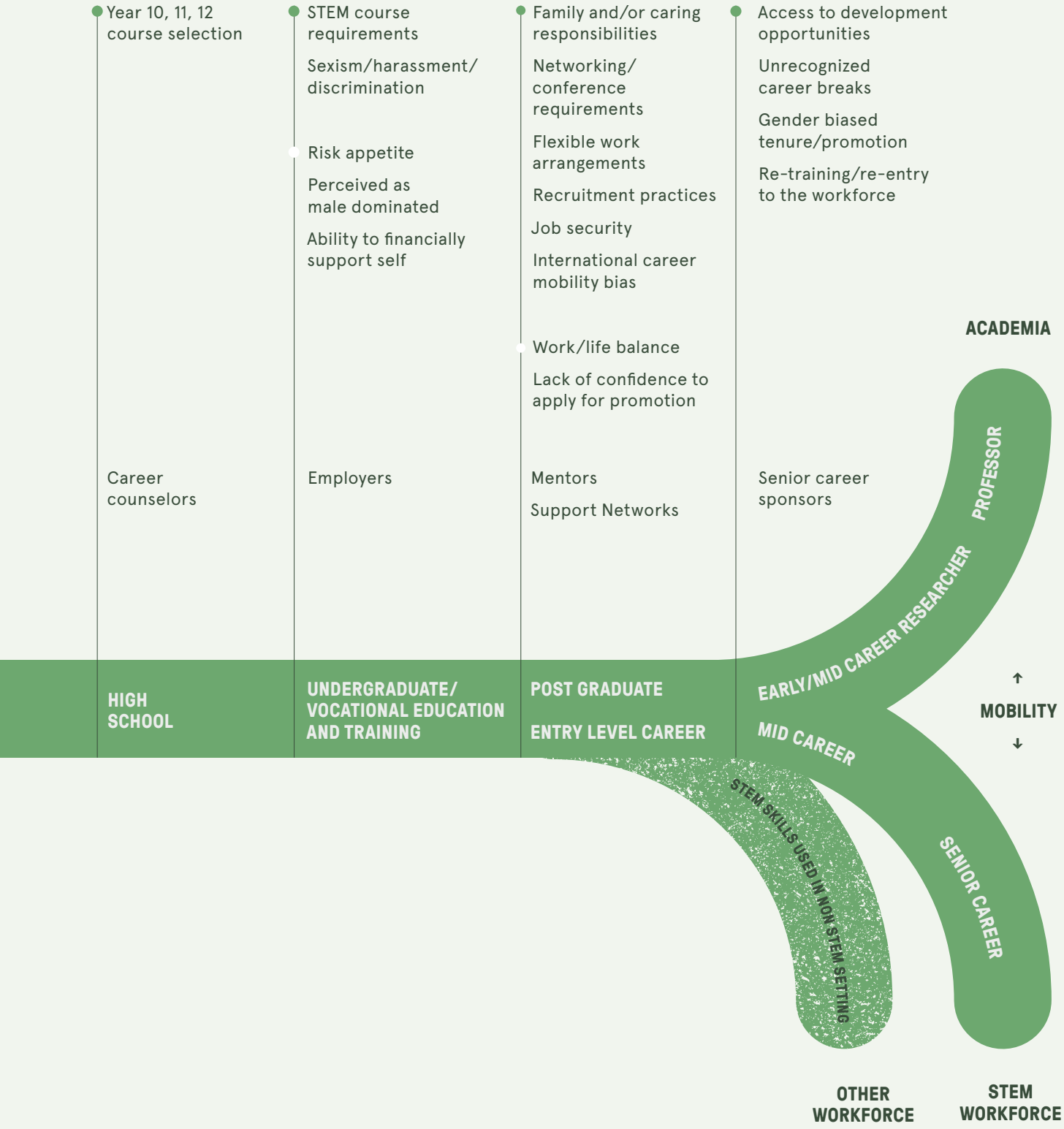
The STEM gender gap is commonly explained as a "leaky pipeline" problem, whereby women leave STEM fields in increasing numbers over time. While visual, there are several limits to this metaphor. This model implies that the STEM gender gap's "pipeline problem" is that there is a dearth of female talent or interest in pursuing STEM careers. It does not capture the range of systemic, formal, and informal pressures that push women out of STEM at various points of their education and careers. In addition, A pipeline with only one entry point does not consider the fact that women ***reenter*** STEM fields as opposed to dropping out permanently. This also suggests that if a woman does not have sufficient interest, support, or opportunity to pursue STEM at the start of her education, then she can never have a STEM career. Women with non-STEM backgrounds often find or create job opportunities in STEM throughout their careers. This is particularly true with the growth of national and global tech industries, which create new sectors and occupations.[30]

Several alternative models have been developed to capture these missing components, such as the image in Figure 1 featured in the Government of Australia's Advancing Women in STEM Strategy.[31] However, the "leaky pipeline" remains a popular shorthand for explaining women's STEM trajectories.

Figure 1: A Model for Women's STEM Journey



Source: Government of Australia's Advancing Women in STEM Strategy


Year 10, 11, 12 course selection
STEM course requirements
Sexism/harassment/ discrimination
Risk appetite
Perceived as male dominated
Ability to financially support self
Family and/or caring responsibilities
Networking/ conference requirements
Flexible work arrangements
Recruitment practices
Job security
International career mobility bias
Work/life balance
Lack of confidence to apply for promotion
Access to development opportunities
Unrecognized career breaks
Gender biased tenure/promotion
Re-training/re-entry to the workforce
Career counselors
Employers
Mentors
Support Networks
Senior career sponsors
ACADEMIA
PROFESSOR
EARLY/MID CAREER RESEARCHER
MOBILITY
MID CAREER
SENIOR CAREER
HIGH SCHOOL
UNDERGRADUATE/ VOCATIONAL EDUCATION AND TRAINING
POST GRADUATE
ENTRY LEVEL CAREER
STEM SKILLS USED IN NON STEM SETTING
OTHER WORKFORCE
STEM WORKFORCE

The following section examines the major barriers that women in STEM face that networks are working to address.

GATEKEEPERS

Parents, teachers, media, literature, film, and education materials often reinforce gendered bias and stereotypes. Gatekeepers, including parents, teachers, and counselors, may unintentionally limit girls' exposure to STEM, reduce girls' confidence in their abilities, and contribute to self-selection bias whereby girls `decide' that STEM is not for them.[20] Early stereotyping and lack of exposure can lead to a lifelong lack of confidence in STEM aptitude. Vida Valkyrie Subingsubing and Justine Raagas of STEMpower Our Girls in the Philippines described how a seventh-grade student wanted to apply to a science high school, but was unable to do so because her homeroom advisor did not view her as a top student and would not endorse her application. "When I heard that," Ms. Raagas said, "I really felt sad. Just to hear someone tell her that this isn't an opportunity for her."

MALE PEERS CAN ALSO ACT AS GATEKEEPERS

Jenna Holliday, former director of the social enterprise Catalyse Change, notes, "We have a lot of girls talking about how they are treated as a quota and are told by their male peers that they are meeting a quota instead of earning their way to their role." The subliminal message that girls are in STEM fields not because they deserve to be, but because they are meeting a quota, undermines confidence and ultimately contributes to attrition.

CAREER INSECURITY, WORKPLACE POLICIES, AND PRACTICES

Women's retention in STEM is often inhibited by inflexible workplace policies and practices. In addition, women's pathways to senior positions in STEM can be curtailed or obstructed by inadequate family leave policies or childcare support, cultural biases against working mothers, inflexible work schedules, and insufficient access to or time for upskilling in one's field.[v]

Sociocultural norms prevalent across Asia (and much of the globe) hold women primarily responsible for caregiving responsibilities. As a result, women may require flexible work arrangements to fulfill both home and work responsibilities. Yukako Uchinaga, Board Chair of Japan Women's Innovative Network (J-Win), describes how childcare responsibilities come at a pivotal time in women's careers: in the 30-35 age group, men in STEM can focus on achievements critical for promotion – including publications, patents, and project leadership – while women juggle work and care responsibilities. Without flexible policies or sufficient support for childcare and other unpaid work responsibilities, women may find it difficult to lead new projects, travel, or work long hours, stalling their advancement. Women often leave their careers entirely at this stage. In Korea, having children was the top reason given by women professionals who decided to discontinue their STEM careers (53.1 percent).[21]

BIAS AND DISCRIMINATION

Subtle and overt discrimination in the workplace can undermine women's acumen and accomplishments. Implicit bias in STEM means that "people are not used to looking at women as competent," according to Dr. Nova Ahmed, Associate Professor of Electrical and Computer Engineering at North South University in Bangladesh. Drawing on her insights as a professor and a member of the Global Young Academy's Executive Committee and its working group on Women in Science, Dr. Ahmed notes that one result is that women may be disregarded in hiring or promotion decisions. In these instances, Dr. Ahmed says, "there is no policy barrier, but there is a perception barrier." Undermining women in STEM can

[v] It is also important to note that LGBTQ2+ employees in many Asian countries do not receive the same benefits for partners as married heterosexual couples do, including paid parental leave.

also be more explicit. Dr. Ahmed shared a colleague's experience when professors in one department were given projects with a timeline in anticipation of an upcoming promotion round: "One woman was given a literally impossible deadline, but on top of that she also wasn't able to find all the equipment – her male senior officers had actually gone into her [office] and taken the materials from her room."

GENDERED SOCIAL NORMS

Social and cultural gender norms can limit women's ability to pursue opportunities in STEM. Architect Arvila Delitriana describes how travel can be a barrier for women working with her on bridge-building projects, as women face pressure not to leave their families behind. This is a particular challenge for women in industries such as mining and construction, where workers are expected to work in remote areas for extended periods of time. Family expectations for wives or daughters can also make it difficult for women to enter STEM careers later in life. Jana Marlé-Zizková, Co-founder of She Loves Data in Singapore, notes that women may face significant family pressure not to change paths. She describes how women in her network may believe that they should not pivot to a career in data or tech, despite an interest in doing so, because their families may view the career as unfamiliar or undesirable or perceive a mid-career shift as risky.

LIMITED ACCESS TO NETWORKS

While lack of network support is often a barrier to women's success in STEM, not every woman is able to participate in traditional networking avenues. Networks can be exclusionary based on the entry requirement that one is an "insider," such as a member of a particular university or working in a specified sector. There can be cultural and gendered challenges to networking, such as meeting outside of work hours or a culture of bonding over alcohol. Geography can also be a barrier when networks operate through in-person engagement and interaction.

"ONE WOMAN WAS GIVEN A LITERALLY IMPOSSIBLE DEADLINE, BUT ON TOP OF THAT SHE ALSO WASN'T ABLE TO FIND ALL THE EQUIPMENT – HER MALE SENIOR OFFICERS HAD ACTUALLY GONE INTO HER [OFFICE] AND TAKEN THE MATERIALS FROM HER ROOM."

– DR. NOVA AHMED, ASSOCIATE PROFESSOR OF ELECTRICAL AND COMPUTER ENGINEERING, NORTH SOUTH UNIVERSITY, BANGLADESH

Despite the rise in virtual meetings during the Covid-19 pandemic, some women experience barriers to participation in online networks. These include limited virtual networking literacy, lack of connectivity, and/or technology capacity. There are also cultural biases and gender norms that prescribe how women can access technology in some countries, which can further preclude engagement in online networks. Moreover, some network leaders have reduced online network activities during the pandemic due to "Zoom fatigue."

Above all, due to caregiving and traditional household responsibilities, women across Asia have less free time compared to men to devote to participating in networking events and building professional connections outside of the immediate workplace. This also means that they have less opportunity to develop networking skills, such as comfortably reaching out to others, talking about oneself, and asking for help. Marlé-Zizková notes that a common refrain she hears is "I don't know how to talk to people I don't know."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EFFECTIVE NETWORK APPROACHES: ADDRESSING BARRIERS TO ENTERING AND ADVANCING IN STEM

Networks across the region are employing a range of strategies to bring more girls and women into STEM education and employment – and providing targeted support to guard against attrition and help women advance in STEM careers. Effective strategies include: creating safe spaces for women in STEM to discuss their needs; helping women build confidence in their abilities and vision for their career trajectories; making STEM affordable, approachable, and accessible to women; facilitating mentorship, sponsorship, and network building; raising the visibility of women in STEM and creating role models; and supporting inclusive leadership and institutional change to make STEM fields more open to women.

Differences in the levels and nature of women's participation and leadership in STEM – including across countries, across STEM fields, and at differing levels of seniority within fields – mean that no single approach to addressing barriers can work independently. Instead, the array of successful strategies profiled below illustrates the multiple and targeted ways that networks are addressing these barriers. Even in cases where government-supported networks or other large-scale networks reach thousands of women in STEM, multi-faceted approaches that respond to the diverse and specific needs of women are the most effective.

The six strategies profiled below represent network approaches that have demonstrated sustained success in bringing women into STEM, helping them to stay in STEM, and/or promoting women's advancement in STEM. These are approaches that can be replicated (in part or whole) or adapted to local contexts. They are offered as models and inspiration of what has worked and what can continue to work in countries and contexts across Asia and globally.

STRATEGY 1: CREATING SAFE SPACES

Ensuring physical and psychological safety is an essential part of supporting women's participation and advancement in STEM careers. While workplace safety and security are pressing issues for all women, women working in STEM fields may experience even more pronounced challenges due to the overrepresentation of men in most STEM fields and the fact that women in industries such as mining and energy frequently work in remote, male-dominated environments. Creating safe work environments and cultures of belonging entails ensuring women's physical safety and freedom from harassment. It also requires creating a space where employees feel comfortable to openly ask questions, learn, and develop their skills without fear of judgment or shame.

Several companies support internal networks or Employee Resource Groups (ERGs), which are officially endorsed and resourced by the corporate entity in order to create safe spaces for exchange, often as part of broader DEI strategies. For example, Zendesk's Women in Engineering ERG creates a space where women engineers can meet and build supportive relationships with one another across Zendesk offices. The network's mission is to develop a community where employees can collectively use their talents to improve, innovate, and contribute to their success as engineers. At Google, the Women@ Google Network is committed to empowering all women at Google by connecting, developing, and retaining female talent, creating a culture of inclusion and belonging, and making social impact in local communities. Women@ provides networking and mentoring opportunities, professional development, and community to Googler women across 52 countries. They also operate a Women@Google Tech arm that drives more tailored initiatives specific to that group.

Companies can further their DEI initiatives by working through internal women-in-STEM networks or associations, as well as by working in conjunction with external networks. Emerson, a global technology and engineering company with offices in Asia, furthers its corporate DEI initiatives through support for ERGs such as the Women in STEM/Women Engineers. All of Emerson's ERGs are aligned with the company's purpose, causes, and values. This alignment helps ensure that the ERGs contribute meaningfully to the company's strategic DEI goals (for example in hiring a diverse workforce) and helps to institutionalize and sustain the networks by ensuring their relevance and integration in the strategic work of the company.

Independent networks and associations also play a critical role in creating safe spaces for women in STEM to ask questions, share ideas and experiences, and develop knowledge and skills that can be used in the workforce. She Loves Data's Jana Marlé-Zizková started the network to forge a safe and judgment-free space for women to learn about data and tech. In her work as a data consultant, Ms. Marlé-Zizková had noticed that female clients often turned the conversation over to male colleagues when data was discussed. She began approaching these women privately after meetings to ask why, and many responded that they did not feel educated enough about data science to comment on it – or even to ask questions about it – during meetings. In response, Marlé-Zizková created She Loves Data, a social enterprise offering no-cost workshops on data science, together with mentoring, soft skills development, and networking opportunities. She also initiated a key strategy to break down barriers to entry for women: she made Day 1 of the course open only to women. This all-female class provides a safe space where women with no previous experience with data or tech can feel comfortable asking questions in a supportive atmosphere. After this, the program is open to all. Keeping the entry-level course as a safe space has offered an important entry point into data, particularly for women who might not otherwise have felt comfortable in a data classroom. This has included women returning to the workforce after maternity leave, those experiencing ageism, and those embarking on a career pivot.

Women-only support networks can be particularly effective in providing a safe space for women in male-dominated STEM fields. For example, Women in Mining and Energy (WIME), a strategic hub that supports gender mainstreaming and gender-responsiveness in Indonesia's mining and energy sectors, runs a small support group Ruang Leluasa (RELUNG) where women in those fields can share their concerns and experience coping with gendered pressures at work, including gender discrimination and harassment. The program is facilitated by volunteer psychologists and the network is invitation-only to enable a safe space for open discussion. The UK-based Catalyse Change mentorship program for young women in the sustainability field also works in single-sex spaces as a means of tackling the confidence barrier. Former Director Jenna Holliday notes that conducting trainings, mentorship, and networking in a women-only space allows for a "bit of breathing room." Young women in the network can "practice" discussing sustainability issues and networking in the space, and then, once they are more confident, can transfer these skills to broader professional spaces.

Liz Lee, Co-Managing Director of Girls in Tech Korea, notes that smaller settings can help foster a network environment in which women feel safe to speak openly about the challenges they may be facing at work or to share personal stories of how they have addressed challenges. The network provides a safe space for exchange in part because participants come together outside of their usual social networks and may be more open about specific challenges they are facing. Diversity in age and experience among network members can deepen opportunities for personal growth, according to Lee.

Informal networks can also play an important role in helping women discuss and cope with stresses related to life and work. For example, bx Tang, an employee of a large tech firm in Singapore

who leads and participates in internal corporate networks, mentioned that she also participates in a small informal women's network that meets monthly outside of work. The group started as part of the Lean In movement, following the curriculum, and eventually evolved into an informal support group where participants discuss a range of issues, from personal finance, to negotiation, to work-life balance. "It's a smaller group. It's intimate. Folks trust that what goes into the group stays in the group... There's no judgment." Knowing that this group "is there and super supportive ... is really, really great."

Wendy Johnstone, Chief Operating Officer of Asia Pacific at Zendesk, has also noted the supportive role that women's networks have played for her. "When I first returned to work after my maternity leave, the re-adjustment was tough. Talking to women who understood my experiences really helped me to better identify what I needed to settle back into the office... And I owe much to them - three of the times I have made a career move, it has been because someone in one of these networks thought of me, told me about the opportunity, and spoke up on my behalf, helping to open the door for me to start a conversation." Ms. Johnstone's story also highlights the importance of a STEM sponsor's role as an active advocate for a woman's career trajectory, finding opportunities to make introductions and connections to expand opportunities for a woman to pursue a STEM career.

Dr. Rachel Sheffield, an Associate Professor of Science Education at Curtin University in Western Australia, discussed her involvement in the STEMettes Who Lunch and other informal networks at her university. Members of the STEMettes Who Lunch network, comprised of women in STEM at Curtin, meet monthly over lunch to discuss the personal and professional issues they confront as women in science, as well as to share and celebrate their successes. The network provides a platform for these women to look beyond their immediate faculties (where their work and experience may be siloed) to become part of a larger community and gain perspectives from across STEM faculties at the university. These informal networks also provide platforms for collective action on issues brought to light during network discussions. Dr. Sheffield described how a graduate student shared her experience of being made to sleep in the common room during a scientific research expedition, while her male students were given private rooms. Senior women in the network, many of whom had had similar experiences early in their careers, advocated on the student's behalf in order to improve conditions on future expeditions, while preserving her anonymity.

"WE MOVE ONE STEP FORWARD, AND SUDDENLY YOU WILL SEE GLIMPSES OF CHANGES: A PROUD FATHER, A PROUD MOM SAYING, 'LOOK MY DAUGHTER WENT TO THIS CONFERENCE. LOOK WHAT SHE'S DONE."

– DR. NOVA AHMED, ASSOCIATE PROFESSOR OF ELECTRICAL AND COMPUTER ENGINEERING, NORTH SOUTH UNIVERSITY, BANGLADESH

Given the importance of travel and fieldwork for women in several STEM professions, strategies for making travel safer and more culturally acceptable for women are essential. Dr. Nova Ahmed, Associate Professor at North South University in Bangladesh, describes the ways in which norms around travel constrained her as a student, and how travel can break down barriers and open doors. When she was a university student, she and two male peers decided to participate in a regional computer science competition in India. At the last moment, her teammates replaced her with a male peer, telling her, "You won't be able to travel. We are going by road...and your parents will never give us permission." Now that she is a professor, Dr. Ahmed actively supports her female mentees' travel and participation in regional conferences and hackathons. "Even if there is one female student that needs to travel, I will accompany her myself" to assure parents that there will be a chaperone and that the student will not be the only woman on the trip. Dr. Ahmed also

HOMEWARD BOUND AND HACKATHONS: FORGING NETWORK TIES THROUGH INTENSIVE TRAVEL EXPERIENCES

Homeward Bound is a leadership program that builds global collaboration of 1,000 women with STEMM (STEM plus medicine) backgrounds. Each cohort of 100 women joins the Homeward Bound network, undertaking 11 months of leadership training and collaborative study online, before undertaking a one-month sea voyage to Antarctica.

As profiled in the documentary film The Leadership, the journey is intense and provides a strong networking foundation—not only because the women are engaged in a demanding process of self-analysis and leadership development, but also because they are isolated as a cohort in a remote part of the world on a relatively small ship, away from their families and support networks. Participants have no phone or internet access for most of the trip. Participant Dr. Rachel Sheffield commented, "I spent four weeks with those women, so if I picked up the phone and talked to any of them, we would feel connected... The isolation in Antarctica helped with the bonding – it was a place that was outside everyone's comfort zone, where no one was an expert."

The power of an intense collective experience to forge lasting ties is also evident in the case of hackathons. Dr. Nova Ahmed supports her students and mentees to travel to India and elsewhere in the region to participate in hackathons because these events generate mutual trust, shared understanding, and a collective experience that can serve as a foundation for network ties and collaboration in the future. While students may compete scholastically in a regular university setting, at the hackathon they become a team that works together to solve problems. The setting forces them to actively communicate, share ideas, and build a tangible product together. Dr. Ahmed notes that after students share this experience, they are much more likely to become friends and develop collaborative ideas and businesses in the future.

speaks with parents about the importance of the excursion to the student's education and future career, and why it is essential that no one be excluded based upon their gender. Another strategy that Dr. Ahmed uses is to empower her mentees to design and organize their own team trips. This enables the female students to make arrangements that are conducive to their own participation, while also helping them to build confidence and independence.

Dr. Ahmed believes that travel is transformative: although travel is a barrier to young women's participation in STEM, once this barrier is broken, travel builds confidence, supports educational and professional advancement, and has ripple effects on other girls and women in the community. "We move one step forward, and suddenly you will see glimpses of changes: a proud father, a proud mom saying, `Look my daughter went to this conference. Look what she's done.' I have seen many moms talking to other parents [so that they will allow their daughters to go to a conference], saying `Oh my daughter went last year—don't worry.'" Dr. Ahmed believes that "after every [trip] you come back a different person." Engagement with international networks is a key driver of this transformation. Dr. Ahmed described how she first "felt the power of networking" when traveling to an international conference: "It wasn't just the Bangladeshi students, it was the international community. Sometimes you need to be part of a bigger team and feel like you are not alone."

STRATEGY 2: BUILDING CONFIDENCE

The safe spaces created within networks and mentorship circles enable women to ask critical questions, gain technical and soft skills (such as problem solving, negotiation, and public speaking), and build confidence by practicing these new skills in a safe environment. These skills can then be replicated and built upon in the workplace and broader professional environments.

One of the most important skills developed through women-in-STEM networks is networking itself. Wendy Johnstone of Zendesk notes, "Women's networks have really helped to encourage and propel me forward in my career. When I first stepped into the field, I was much less comfortable with the idea of putting myself out there, asking for help, or even meeting new people. It was really women's networks that showed me the power of women working together; it was a warm and welcoming way to practice building new relationships and leveraging authentic connections." Women-in-STEM networks provide a safe space for women to practice building personal and professional relationships with others beyond their immediate technical or functional groups.

Given the importance of networking for career advancement, several networks provide dedicated training on effective networking. WIME offers a soft skills course delivered by professionals that aims to improve women's communication and interviewing skills and that provides opportunities for collaboration with women for other organizations. CodeOp, a program that helps women and gender non-conforming individuals to transition into or upskill in tech, provides training and networking support in the tech sector. Because CodeOp students are transitioning into tech, many do not have a LinkedIn page or know how to approach networking in the sector; CodeOp helps them set up an online networking presence so they can develop their professional network from there. The Catalyse Change network leverages LinkedIn, Instagram, and other existing platforms for mentors and mentees to connect, while also encouraging mentees to access the broader networks these platforms provide to expand their professional reach. Mentees develop CVs through LinkedIn as they progress through their mentorship, so that by the time they are ready to apply for an internship or job, they have a well-established online presence in the sustainability field from which to work.

Another important way in which networks help women build confidence is through frank discussions of the challenges that women in STEM experience and reassurance that women can

succeed despite these challenges. Linartes Viloria, National Project Coordinator for the Women in STEM Workforce Readiness and Development Programme in the Philippines, explains, "I think that I've moved on from trying to be encouraging to trying to be realistic. In coding there are moments that [people] will get frustrated…I think that's important for women to know that challenges are normal. You are just going through the same phase that everyone has gone through." Katrina Walker, Founder and CEO of CodeOp, concurs. When students in her tech bootcamp consider dropping out, she speaks with them frankly about the difficulty of the program and the emotional strength needed to confront an intimidating field. "This is hard," she tells them, "But you can do it." She also asks them to reserve judgment until they have completed the course, as the success of completion is an important confidence-builder. Sandy Noche, a member of the Women Engineers Association at Emerson in the Philippines, shared that when he gives career talks at universities as part of outreach and recruitment efforts, he shares that he was not an honors student in college, but was curious. "I'm always telling them that STEM is hard for everybody. I was able to get this leadership position despite not having very strong grades in college."

Several respondents also noted that sharing stories of imposter syndrome[vi] within the safe space of the network can be enlightening and reassuring to women in the group. Women are often shocked to learn that another member of the group whom they view as clearly successful would have the same "imposter" feelings that they do. Discussions around these feelings can be transformative, leading women to examine their own self-doubt in the same way they questioned the self-doubt of others in the group. When coupled with strategies such as the #IAmRemarkable initiative,[23] networks can support women to more fully recognize and embrace their achievements.

BUILDING CONFIDENCE AMONG WOMEN CONSIDERING STEM

Vani Mahadevan, Founder of TechSprint Academy in Malaysia, believes that the biggest barrier to women's entry into STEM is mindset—the belief that they are not capable of doing STEM work.

To break this barrier, all projects in TechSprint's 4-day introductory course are project-based and relevant to the job market. Course instructors are practitioners, not academics, to ensure that instruction is closely linked to industry trends. After only 4 days, women must showcase the website they have built. This product becomes the evidence that they are capable of working in tech. Ms. Mahadevan's main objectives in this introductory course are to build students' confidence in their abilities and to foster an interest in and willingness to learn more. Having a tangible product to show after their 4-day training gives them the confidence to continue on this journey.

STRATEGY 3: MAKING STEM AFFORDABLE, ACCESSIBLE, AND APPROACHABLE

Women-in-STEM networks and training programs address key financial, socio-cultural, and emotional barriers to make STEM education and careers more accessible to women and girls. These strategies include providing free and low-

[vi] Imposter syndrome is a psychological pattern in which an individual doubts their skills, talents, or accomplishments and fears being exposed as a fraud. It disproportionately affects high-achieving people, who despite outstanding academic or professional achievements persist in believing that they are not bright and have fooled anyone who thinks otherwise.[22]

cost training programs and hardware; supporting a cost-benefit ratio that makes women's investment of their time and money pay off in terms of career prospects; directly addressing individual and familial socio-cultural barriers to women in STEM careers; showcasing relatable role models; and helping women to overcome individual hurdles associated with confidence in STEM (see the Building Confidence section above). By addressing these barriers, discussed in detail below, networks attempt to make STEM more affordable, accessible, and approachable for women.

Addressing financial barriers. Cost can be a prohibitive barrier for women entering STEM careers, including those considering a mid-career transition. Several networks and training programs aimed at bringing girls and women into STEM therefore offer **free courses, scholarships, or flexible financing models**. Jenna Holliday launched a tuition-free mentorship program model through Catalyse Change so the network could recruit young women who did not have financial support from their families and who might not know that a STEM career was an option for them. Jenna felt strongly that this financing model was critical, noting: "I didn't want the girls to have to pay for empowerment."

Organizations such as Women Who Code (WWCode), Girls Who Code, and She Loves Data offer free courses as part of explicit strategies to make STEM accessible to women and girls, with the goal of closing the gender gap in tech. Free courses significantly reduce the barrier to entry by making information, knowledge, and skills accessible without cost and therefore with very low risk. By lowering or removing the financial hurdle, these programs offer girls and women a means of exploring new fields and gaining marketable skills by investing time and energy. Importantly, free informal courses also provide exposure to trainers and practitioners who can potentially serve as mentors or future employers, expanding women's and girls' professional networks in STEM fields.

Several organizations offer no-cost entry-level courses followed by fee-based advanced-level courses. TechSprint has a non-profit arm that helps women step into tech careers or transition to tech incrementally: once the women have some facility with tech, they can determine whether a tech career makes sense for them and whether they are ready to make a financial investment in a tech education. Filipina Homebased Moms (FHMoms), a network that supports mothers in the Philippines to develop and progress in online careers, offers seven free introductory training webinars on how to get started in an online freelance career, as well as no-cost daily webinars on soft skills.[vii] In addition, FHMoms offers rent-to-own hardware on its website for women starting out in this career. Overall, there is a **high level of granularity in the fee structure**, allowing women to carefully choose those aspects of training that they feel will be most useful to their careers. The fact that all these courses are available online and can be accessed at one's own pace means that women with a stable internet connection can pursue them without needing to commute or obtain childcare.

Given women's disproportionate caring and household responsibilities, the requisite investment of time required to achieve one's goals is often weighed carefully in a woman's decision about whether to join a STEM training course. Vani Mahadevan, Founder of TechSprint in Malaysia, notes that even in the case of TechSprint's free and subsidized courses, she must make the argument to women that STEM training will provide long-term financial stability, job security, and/or flexibility for greater work-life balance. To engage more women in tech training, Vani explains, "Women need to know that there is real employment at the end." She Loves Data's Marlé-Zizková similarly encourages women to learn about and work with data as a means of "future proofing" their careers – with data skills, Ms. Marlé-Zizková argues, they will always have a job.

[vii] Course enrollment beyond this incurs modest fees, with both short (one week) and mastery (one month) courses available.

Addressing socio-cultural barriers, including gatekeepers. Ms. Marlé-Zizková and Ms. Mahadevan have both found, however, that an economic argument is often not enough to convince women to transition to tech mid-career — socio-cultural barriers must also be addressed. Ms. Mahadevan explains how the mid-career women she recruits in Malaysia frequently do not see a connection between their earlier work experience and tech. Ms. Marlé-Zizková notes that women in Singapore and elsewhere in Asia may also face pressure from their families not to change fields mid-career since they are already "doing something that works." To address these barriers, Ms. Marlé-Zizková and Ms. Mahadevan explain to women who are interested in their programs that **gaining data and tech skills is additive**: these skills build upon and enhance women's current knowledge, increasing their marketability for jobs in their core areas. For instance, gaining data or tech skills could enable women to build a website for their current employer or go into greater depth with data analysis of their core discipline.

Another way in which networks support girls and women to enter STEM is to **target "gatekeepers" to their participation**, including family members, teachers, school counselors, and other mentors who play important roles in influencing women's and girls' decisions to go into STEM fields. Organizations such as the Center for Women in Science, Engineering, and Technology (WISET) in Korea, J-Win, FHMoms, and STEMpower Our Girls all include programming and activities targeting these influencers to help them better understand the value of STEM education for girls and the diverse range of career opportunities open to women in STEM.

WISET targets both parents and teachers to convey the message that STEM training can lead to stable and high-paying jobs in industry. WISET and J-Win both help parents see the benefits and potential of STEM education for their daughters by **spotlighting success stories of women in business and research in STEM fields**. This includes highlighting female founders and employees of STEM startups, as startup enterprises may seem risky to some parents. WISET highlights STEM role models in a variety of media and social media outlets to target girls, women, their parents, and society at large. At least twice a month, WISET conducts an interview with a female STEM leader or produces a video highlighting her achievements, which is then shared via social media to reach younger women and shared via traditional media (including broadcast news) to reach the parents of girls who might go into STEM. Dr. Ahn Hye-Yeon, President of WISET, notes that these vignettes of women in STEM careers help families better understand the range of jobs available to women – jobs these families may not know about or may consider "only for men." By making female STEM role models visible, WISET's programming makes it possible for families to envision girls or women within their households pursuing such positions.

FHMoms, which supports women to develop online careers, targets husbands in their outreach and advocacy, including as gatekeepers. MK Bertulfo, Founder of FHMoms, notes that some husbands in their network are not supportive of their wives' efforts to develop an online career—often due to a fear that platform work will not be a stable source of income. To address these concerns, FHMoms actively helps these women land jobs and shares success stories of women in the network who have already achieved success. Women in the network also frequently leverage the network's resources to convince their husbands of the viability of this career by asking them to join the free webinars. Participating in the network can spark their husbands' interest and, in some cases, leads to their becoming involved in the same industry. The FHMoms network, which currently has 339,500 members on Facebook, is now joined by a smaller husbands' group, "Pinoy Homebased Dads" (PHDads) with 15,000 members.

CULTIVATING GATEKEEPERS TO KEEP GIRLS IN STEM

Justine Raagas of STEMpower Our Girls, a program that supported sixth grade girls in the Philippines to sustain their interest in STEM, has underscored the importance of reaching both parents and teachers, together with students.

She explains: "What we've learned is that teachers are super important in this pipeline. When students are applying to programs, teachers write recommendations. They are also the first gatekeepers. They can say that you are not good in STEM or it's not a good fit for you, and then encourage you not to apply to a given high school." Since teachers play a primary role in influencing girls' decision-making regarding subjects studied, type of high school chosen (technical or non-technical), and career paths pursued, STEMpower Our Girls actively engaged teachers in program activities and outreach. The program employed a professional marketing and public relations company in partnership with an education non-profit to design a media campaign that targeted students, parents, and teachers on the importance of preparing girls for the future of work through STEM training. This included generating awareness of unconventional STEM career options; tech and computer science careers were foregrounded, as many of the parents had not considered these to be STEM careers. Messaging also showed girls engaged in and excited about STEM projects, which inspired parents to support these endeavors.

CONNECTING PERSONS WITH DISABILITIES (PWDS) TO ONLINE CAREERS

FHMoms supports a diverse workforce of women in Business Process Outsourcing (BPO), including PWDs and mothers who have children with autism and other special needs.

The ability to work from home and the flexible work schedule have made BPO a compelling option for PWDs and those caring for PWDs. FHMoms has profiled successful women with mobility challenges and other disabilities who have developed online careers through FHMoms in its promotional materials, and the network has actively worked to build on this success by opening doors to more PWD. To improve the network's outreach to PWD and responsiveness to disability issues, FHMoms partners with Virtualahan, a network with a disability focus. As part of their partnership, FHMoms and Virtualahan organized a "friendship day" so that their respective network members could meet and interact online. FHMoms also recommends that PWDs in the FHMoms network join Virtualahan's community. In addition, FHMoms provides speaking opportunities to Virtualahan's PWDs coaches and mentors to provide knowledge and inspiration to the broader FHMoms network.

Addressing personal barriers through role models. In addition to addressing structural barriers, networks are addressing the personal barriers that women face in pursuing STEM education and careers, such as lack of confidence. Many organizations highlight the stories of successful STEM women, including in fields that some may not immediately think of as "STEM," as role models so that women and girls perceive career opportunities and can imagine themselves in those positions. Networks drive this point home by hosting not just successful, but **relatable women to share their personal stories in STEM**. For instance, the Women in STEM Workforce Readiness Program in the Philippines holds a series of career talks featuring women who successfully made the transition into tech-based careers, including through a career pivot or after having children. Linartes Viloria, the National Project Coordinator of the program speaks of the success of MK Bertulfo of FHMoms, who built a network of nearly 350,000 women in online freelancing. Ms. Viloria comments, "It's amazing. How do you manage all these moms? It's easy to like her because she's very personable. She can just be the girl next door who has a son and is trying to make living. You see her and think, `if she can do it, I can easily do it.'" The women in the group come away from these talks "knowing that other women have been able to do it despite all the challenges." The strategy of showcasing successful relatable women has proven highly effective in generating enthusiasm among her students, leading several to pursue higher-level tech courses.

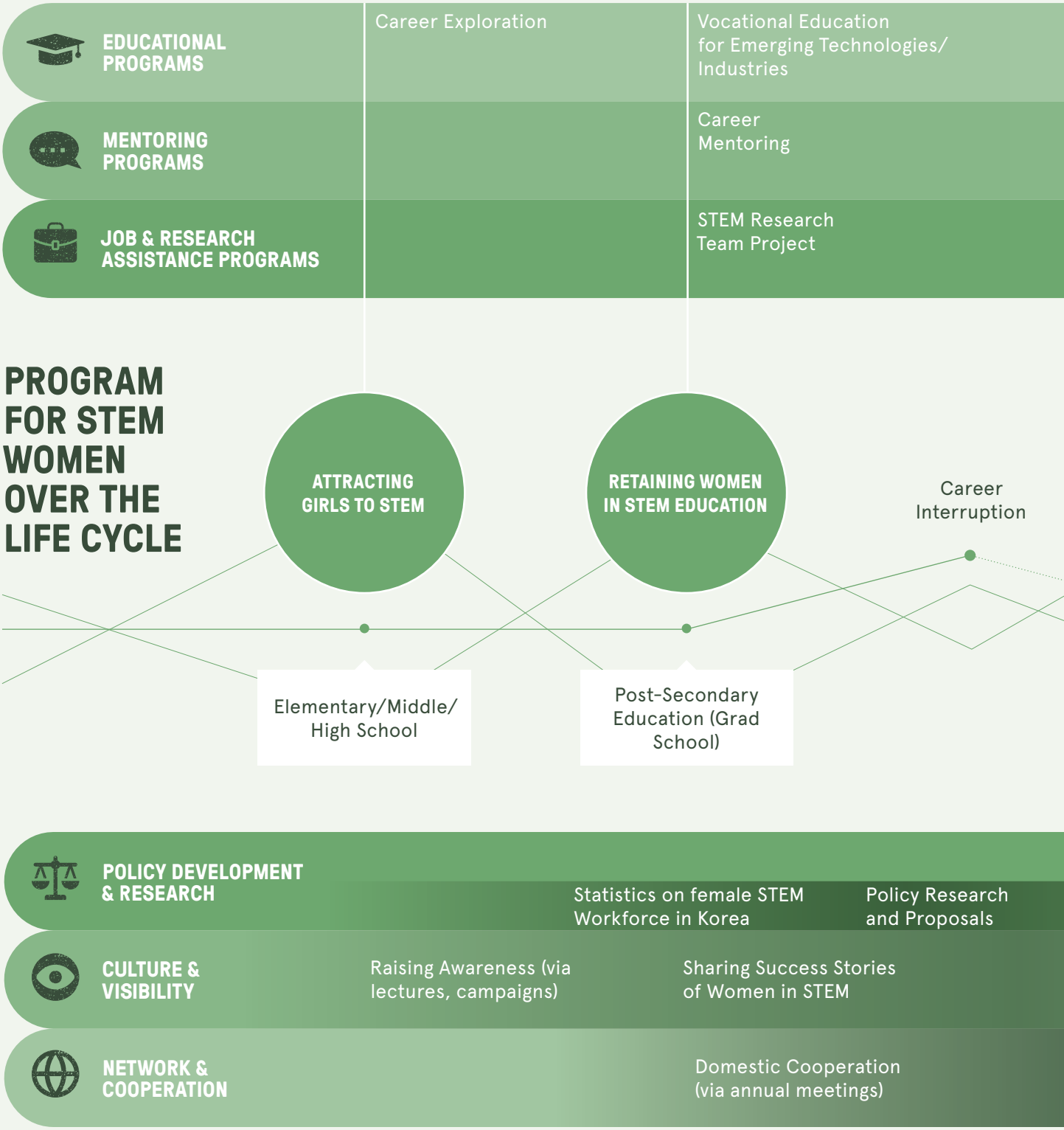
Networks also **demystify STEM content** to attract girls and women who may find STEM intimidating. For instance, STEMpower Our Girls make STEM lessons fun for users by teaching biology and chemistry through animation and multiple-choice questions on topics of interest. FHMoms organizes entertaining events hosted by celebrities and contests for women in the network, with hardware for online careers as prizes, to motivate participation while providing requisite skills and career inputs.

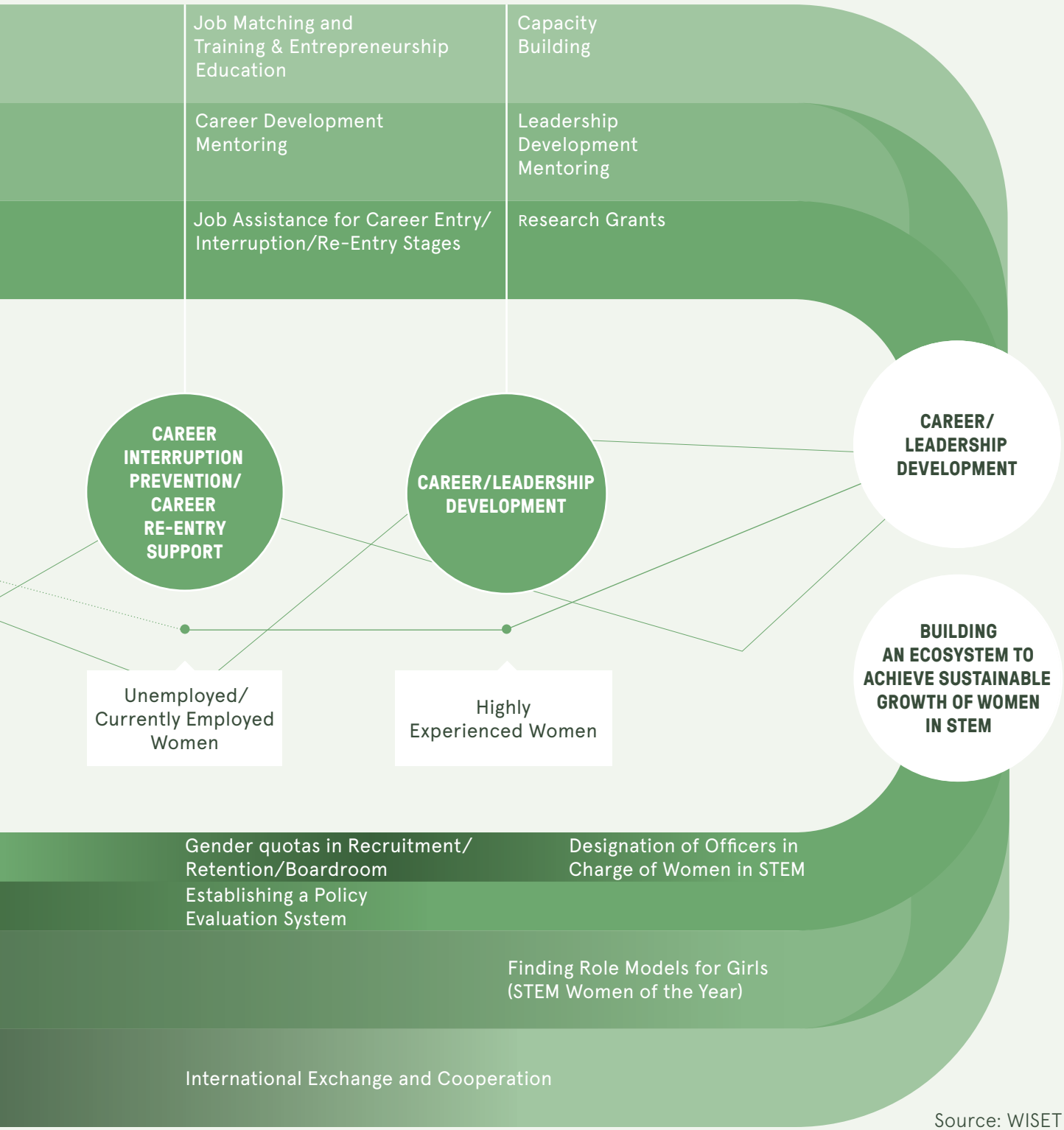
STRATEGY 4: MENTORSHIP

Networks play a critical role in supporting mentorship at all stages of the lifecycle: from bringing girls and women into STEM education, through supporting their transition to STEM careers, to bolstering their resilience against attrition once in STEM.

Mentoring is essential for retention and advancement at all levels of STEM education and careers. Networks use mentorship as a primary tool to stem the "leaky pipeline" at junctures where significant numbers of women are leaving STEM fields. In the Republic of Korea, WISET employs a comprehensive "lifecycle" approach that identifies the challenges women experience at critical junctures in their education and career and responds with mentoring and other targeted interventions to address these specific challenges (see Figure 1). To address the "leak" between mid-career level and senior leadership levels, for instance, WISET launched a mentoring program that matches mid-level professionals with senior-level professionals. Mentors support their mentees by actively listening to their concerns and empathizing with them, by sharing personal stories about how they handled similar issues in the past, by engaging in discussions on work-life balance, and by providing career advice and encouragement. Figure 2 shows the critical junctures at which WISET uses mentoring as a strategy to reduce attrition and support women to advance in STEM fields.

Figure 2: WISET's Lifecycle Approach to Addressing the Leaky Pipeline





Source: WISET

"I APPRECIATE THAT THERE ARE SENIOR WOMEN IN LEADERSHIP WILLING TO TAKE THE TIME TO HELP SOMEONE. THE ANSWER IS ALWAYS A RESOUNDING YES WHEN I REACH OUT TO WOMEN MORE SENIOR FOR 30 MINUTES TO ASK A QUESTION."

– ANNA LEE ANDA, UX RESEARCH MANAGER, ZENDESK

Key informants for this research echoed the importance of recognizing that girls and women face distinctive barriers at different points in their education and careers. Dr. Nova Ahmed stated, "Some of the challenges for young researchers are not challenges to the older researchers." Dr. Sarah Brough pointed out that women at the initial stages of the academic career ladder must contend with lower-paid fixed-term contracts, meaning that they are under greater financial strain, have low levels of job security, and have little control over where they live. These specific stresses fall away, however, for academics who achieve tenure (to be replaced by different stresses). It is therefore essential for mentors and others in women-in-STEM networks to listen carefully and with an open mind when others speak about the stresses and challenges they are grappling with, since these may not always map to one's own. Wendy Murphy, Associate Professor of Management at Babson College, advises listening with empathy "to understand, affirm, and validate what your mentee needs" while managing one's own reactions or discomfort.[24] By listening carefully, mentors can better understand their mentee's needs – even where these diverge from the mentor's own current or past experience – and be more effective in identifying opportunities, opening doors, and connecting mentees to assignments that will be truly meaningful to them and support their advancement.

Mentorship training and coaching supports success. Catalyse Change, which uses mentoring as the basis for network building, strives to ensure the quality of the mentor-mentee relationships through substantial training and support for mentors. The organization provides prospective mentors with a full day of mentorship training (including role playing) and a handbook on mentoring that includes information on how mentoring sessions should be structured, goal setting, and other critical skills. Once the mentoring relationship is established, the program provides mentors with access to a coach for regular check-ins so they can ask specific questions on how best to guide mentees as the relationship evolves. Jenna Holliday notes that this intensive training is critical, as the program has found that when mentors do not feel confident in their ability to mentor, then the mentor-mentee relationship tends to be less successful. The program's intensive support for mentoring seeks to build mentors' own confidence so that these mentors can model confidence as a means of helping their mentees to build it. North South University's Dr. Nova Ahmed notes that this process of confidence-building through mentorship is, in fact, a two-way process: "Mentoring helps the mentor too. Someone is looking up to me." Dr. Ahmed believes that the mentoring relationship is a critical means of helping sustain confidence among senior women in STEM.

Mentorship is critical for supporting the transition from education to industry. WIME in Indonesia runs the STEM Female Graduates Mentorship Program, which aims to facilitate the transition of women graduates in STEM fields into careers in the mining and energy sectors through mentorship by experienced professionals in the WIME network. The program provides mentees with industry connections who help them develop a more detailed understanding of their chosen field and who guide them to set specific goals within it. At a broader level, the network leverages these mentorship connections to drive

greater participation of women in these male-dominated industries. Recognizing that many young women who are considering careers in mining and energy have concerns about working in male-dominated environments, the mentorship program directly addresses these concerns, including through training in soft skills for negotiating and succeeding in male-dominated recruitment processes and work environments.

Ying Wories-Lin, Principal Program Manager at Microsoft Corporation and Co-founder of LevelUp Seattle: Senior Women In & For Tech, has been involved in several women-in-STEM networks and believes that programs that link university students to industry are highly effective. Universities can collaborate directly with companies or industry associations to set up such programs, with mentors providing concrete tips for making the transition from school to work (including interview tips, presentation skills, and resume review) as well as broader advice on anticipating and navigating the types of challenges frequently faced by women in STEM. Ring mentoring — where 1-2 mentors work with 10-12 mentees — can be particularly effective, as it not only establishes one-on-one relationships between the mentors and mentees, but also engenders the growth of a supportive peer network among mentees.

TechSprint integrates a substantial mentorship component into its Reboot program, which is designed to help women build up the necessary skills and confidence to return to work or launch their own ventures in a more digital world. While the course itself lasts only four days, mentorship extends for two months beyond the end of the course and is an essential means of supporting students to network, transition to the job market, and pursue career opportunities. Each mentee sets out her own action plan for these two months, and mentors (all of whom are female professionals or entrepreneurs) coach them through the plan, while providing access and introductions to their broader professional networks.

STRATEGY 5: RAISING THE VISIBILITY OF WOMEN IN STEM

Networks play an important role in raising the visibility of women in STEM fields, both as a means of solidifying role models and of elevating the achievements of women scientists in the eyes of powerholders and the public at large. This includes supporting women in the network with tools to increase their own visibility in culturally and professionally appropriate ways as a means of driving their own professional advancement.

Networks including J-Win, WISET, and Girls in Tech Korea profile the work and experience of successful women in STEM through speaking engagements and public campaigns designed to inspire the next generation of women in science. The Australian Government's Superstars of STEM program increases the public visibility of women scientists and technologists as role models for young women and girls, while promoting equal representation of women and men in STEM in the media. Over five years, the program has equipped 150 women in STEM fields with advanced communication skills and opportunities to become highly visible public role models through public speaking engagements and in the media. WISET elevates the work of successful women in STEM through the production of videos highlighting women's cutting-edge work and high-profile interviews with these women, which are broadcast on television and shared through social media. WISET President Dr. Ahn explains that many female students are unaware of the work women are doing in STEM fields—or that these sorts of jobs even exist. WISET has found the video vignettes to be highly effective in generating interest in STEM among young women and in broadening their understanding of viable career opportunities in STEM fields. As Marian Wright Edelman, Founder and President of the Children's Defense Fund, famously said: "You can't be what you can't see."[25] Networks are breaking down this barrier by creating visible role models and illuminating the diversity of STEM careers open to women and girls.

"THIS IS THE BIGGEST PIECE OF ADVICE I GIVE TO OTHERS—IT GOES AGAINST WHAT WOMEN HAVE BEEN TAUGHT FOR A LONG TIME... IF YOU'VE DONE GOOD WORK, MAKE SURE THE RIGHT PEOPLE SEE THE WORK."

– ANNA LEE ANDA, UX RESEARCH MANAGER, ZENDESK

This work of elevating women's achievements in STEM is essential not only for piquing the interest of new entrants into the field – and working to reduce the gender imbalance in most STEM fields – but also for supporting the advancement of women already in STEM careers. When initiatives such as the Superstars of STEM program spotlight women's achievements in the public sphere, the widespread recognition of these women and their achievements can drive career advancement, while opening further opportunities for collaboration and access. Dr. Tien Huynh, a senior lecturer at Royal Melbourne Institute of Technology (RMIT), describes the effect that recognition as a "superstar of STEM" has had on her career: "The benefits were more than I ever expected, from features on SBS World News that had international reach, Nature magazine that led to collaborations with world leading researchers, and segments on Gardening Australia leading to invitations as an honored guest and speaker with top ranking Indian universities. I also had my documentary from the 8-Percent Productions shown on Virgin Airlines for 3 months and was praised in the most widely circulated newspapers in Vietnam and India such that hotels treated me like a celebrity."[26]

By raising the visibility of women's achievements, networks facilitate external recognition of these achievements. This "third-party" recognition, whereby the network provides public visibility on behalf of women scientists, is particularly valuable in cultural contexts where women may be discouraged from calling attention to themselves or their achievements. Dr. Rachel Sheffield, Chair of Curtin Academy in Western Australia, notes that their network "does the branding for our members. We celebrate their achievements. People get kudos without being seen to be big-headed." Moreover, third-party recognition, including through awards, tends to lend additional weight to these achievements, as they are presented publicly as already "peer reviewed" or "recognized."

A number of women-in-STEM networks also support their members to increase their visibility in culturally and professionally appropriate ways in order to drive their own professional advancement. The Australian based business leader, Fabian Dattner, CEO and Co-founder of Homeward Bound, notes that "men network more effectively to advance their careers and influence...the issue of visibility very rarely causes men grief – they accept, understand it, it goes with the [territory], it's not seen as ego." She argues that women tend not to feel as comfortable making themselves visible for networking and career advancement. Given the importance of visibility for leadership and advancement, the Homeward Bound program helps women develop skills for "how to be visible without vanity." Women in the network are asked to write their own leadership narrative, and in the spirit of collaboration, make it available for peer review and community feedback. As part of this process, each woman in the network receives coaching to address any fears associated with visibility.

The #IAmRemarkable initiative, which started as an internal workshop at Google but has since expanded to 800 companies in over 130 countries, similarly focuses on helping women and members of underrepresented groups become comfortable making their own achievements visible: "One of the big hurdles women and underrepresented groups face when tackling the leadership gap is practicing self-promotion — or vocally expressing their achievements in a working environment. The benefits of self-promotion are vast — including taking control of how you're perceived by others and making them understand the

unique contribution you can make."[27] This program, too, starts with writing about oneself and one's achievements—and why these are remarkable. In both Homeward Bound and #IAmRemarkable, the network provides a safe space for articulating personal achievements in ways that may initially feel uncomfortable, but with practice become more natural. From here, women can move beyond the safe space of the network to share their skills and contributions in broader professional environments.

Within public and private sector organizations, managers and leadership can also play important roles in making women visible within informal networks and in formal management discussions to help support women's advancement. When colleagues speak informally about new job openings or other career opportunities, women and men who take part in these conversations can help ensure that multiple names of women and others from underrepresented groups are brought into the discussion. Similarly, when senior-level departmental discussions are held on promotion, awards, and leadership opportunities, those with seats at the table can support women's visibility by nominating multiple women to the pool of candidates and providing evidence of their achievements and credentials. Ensuring that an equal number of women are visibly represented in these candidate pools can both influence attitudes among leadership about who is well-suited to such positions, and increase the probability that women will be appointed to them.

STRATEGY 6: LEADERSHIP AND INSTITUTIONAL CHANGE

One of the most important ways that networks can support women's advancement in STEM careers is by contributing to institutional change in private and public sector organizations. Networks are accomplishing this by developing company cultures that support diversity, empowering women with the tools to lead, and engaging corporate leaders – including men – to push for gender equality within their institutions. Several network profiles follow.

Developing leaders and fostering a company culture that support diversity, while empowering women with the tools to lead, are the Japan Women's Innovative Network's (J-Win) two-fold approach to systemic change. J-Win uses a unique strategy to achieve women's advancement in STEM careers: it manages a network comprised of Japan's largest companies and works directly with and through them to drive change. Recognizing the power and influence that large companies have in Japanese society, J-Win's Founder Yukako Uchinaga made a strategic decision to put these companies at the center of the network's efforts to promote women's empowerment in the Japanese workforce, including for women in STEM. J-Win operates as a non-profit, and companies pay a membership fee to join the network. In return, J-Win provides a variety of programs for accelerating diversity and inclusion at member companies and ongoing analysis of each company's progress.

An essential part of J-Win's strategy is to foreground women's empowerment at the highest levels of leadership. J-Win works directly with CEOs to ensure that they see gender diversity as an essential part of each company's management strategy, leveraging diversity and inclusion to drive innovation and gain a competitive edge. Ms. Uchinaga explains, "There needs to be a clear message from the top that women's advancement is a priority. The CEO must recognize and communicate the importance of diversity."

J-Win works with companies to ensure that this message is communicated and mainstreamed throughout the company and that accountability mechanisms are put in place to ensure implementation at all levels.

In parallel with J-Win's focus on institutional change, the network also supports three levels of women's leadership networks: the High Potential Network comprised of women on track to become senior managers at their companies (and who are selected by network member companies to participate in J-Win's one-year intensive leadership program); the Next Stage network, which supports women at the management level to expand their connections and develop their careers; and the Executive Network, which provides a core group of women who hold board or executive-level positions in Japanese companies with space to focus on leadership, women's advancement, and shared challenges. All three levels of the network include women-in-STEM subcommittees to address issues specific to women working in STEM fields, including the low proportion of women in technical positions.

To link the work of these two strands – the corporate-level network with a focus on diversity and inclusion, and the three layers of women's networks focused on leadership development – Ms. Uchinaga encourages members to model this network structure within their own companies. More than 4,000 women have participated in J-Win's leadership networks, and the extended alumnae network is represented in over 100 Japanese companies, including at the highest levels. As J-Win alumnae create internal networks, they can influence women within their own organizations, expanding a culture of diversity and inclusion. Ms. Uchinaga encourages top executives to support these internal networks and to communicate their importance to management in the organization, so that networks do not meet resistance and are adequately resourced. According to Ms. Uchinaga, women's networks are the most effective means of encouraging women to strive for high-level jobs, including in STEM fields; at the same time, she notes that women will have difficulty achieving their goals if systems are stacked against them.

The Champions of Change Coalition is another network that drives systemic change from the top by engaging leaders to push for gender equality within their institutions. The network is comprised of the heads of institutions, with the STEM Group comprised of leadership from national scientific research and data institutions; universities; and medical, technology, engineering, health, and pharmaceutical businesses in Australia. Since many of these institutions are led by men, the network includes a substantial number of "allies" – men who stand together with women leaders and publicly commit to practical, constructive, and disruptive actions to accelerate gender equality in their organizations and in the public sphere. As one example, all Coalition members agree to the Panel Pledge in which they work to increase the visibility of women in professional forums by participating only in speaking engagements where women meaningfully participate (this includes reserving the right to withdraw, even at the last minute, should the finalized panel list be all male). The Leadership Shadow is another key strategy used to achieve this objective, as it helps leaders understand the impact of their words, actions, priorities, and accountability strategies on employees.

The Champions of Change Coalition's approach seeks to shift systems through institutional change, avoiding solutions that put the onus on women to adapt. Thus, allies start by listening and learning from those in their organizations, particularly women, and from here work to lead on gender equity through action (see Figure 4).

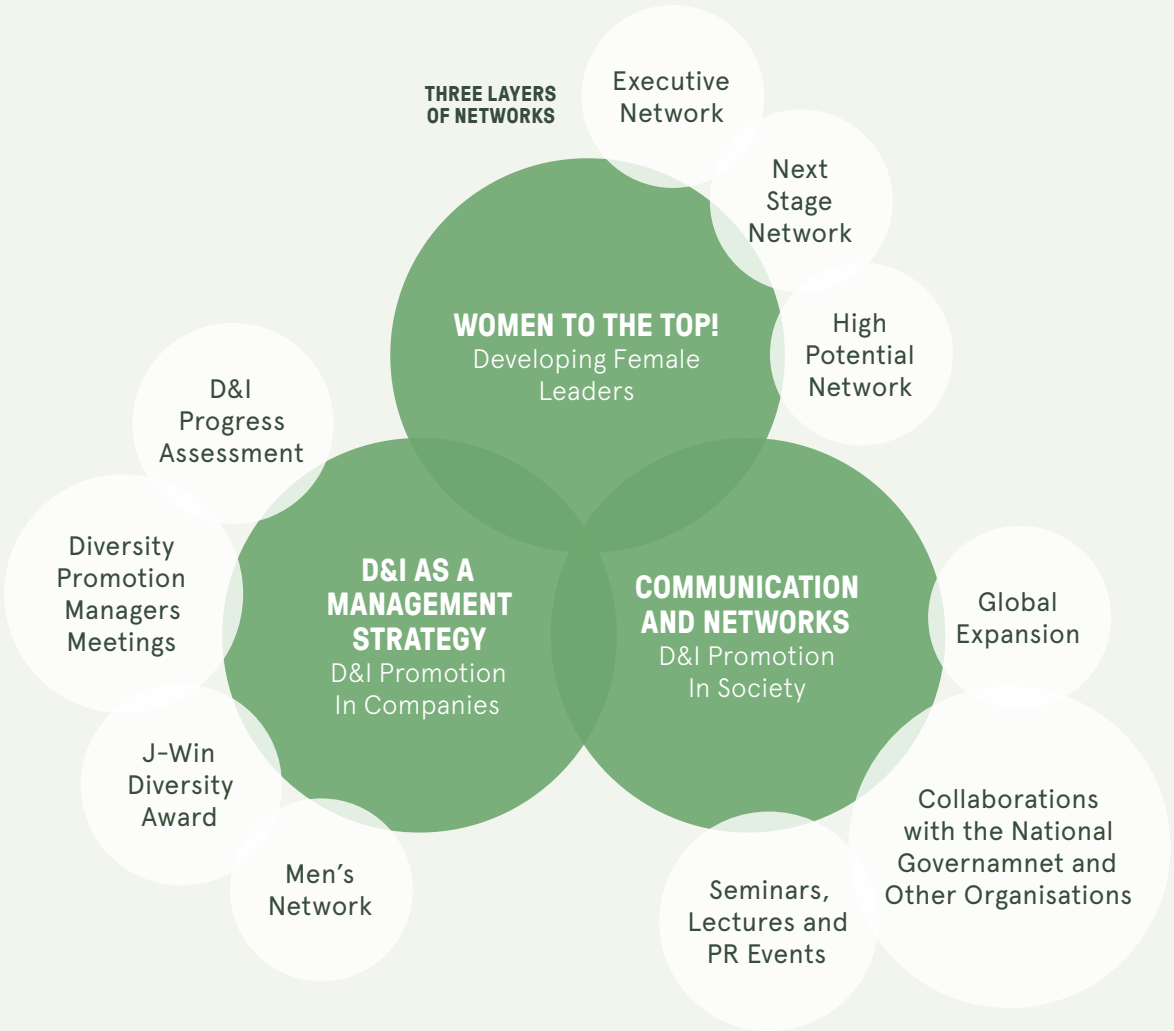
Figure 3: J-Win Objectives and Network Structure

J-WIN'S OBJECTIVES

1 Promote Diversity & Inclusion as a management strategy

2 Help women build networks and provide opportunities for career development

3 Contribute building a society where diverse individuals can fully participate



Source: Adapted from J-Win Non-Profit Organization

Figure 4: Male Champions of Change Approach: Listen, Learn, and Lead through Action

GUIDING PRINCIPLE		THIS MEANS WE...
1	Step up **beside** women	· Listen and learn from women's experience and leadership · Partner with women – a vision driven together is more likely to succeed · Take responsibility with women for accelerating improvement in our organizations · Advocate for women's representation
2	**Prioritize** achieving progress on women's representation	· Treat women's representation as a priority · Continuously listen and learn · Set targets that crystalize intent · Seek out innovative and effective approaches · Invest capital, time, and people to achieve our aspiration
3	Stand behind our **numbers** sharing lessons learned	· Publish and share group results · Take action to remove obstacles to progress
4	**Shift the system,** not "fix women"	· Acknowledge and address systemic biases that get in the way of women's advancement · Avoid the limitation of solutions that put the onus on women to adapt · Recognize that advances for women are advances for men too

Source: Champions of Change Coalition (2016), Male Champions of Change Guiding Principles.

The process begins with the CEO actively listening to groups of women, ranging from young women who have recently started out to women who have been with the organization for many years, about their experiences in the workplace, including barriers to advancement. Ann Sherry AO, who leads the Champions of Change STEM group, notes that this "experience has probably been … the best driver of change because [the CEOs] hear things that they never usually hear. They hear it from the mouths of the women in their organizations … and that's very confronting if you're a CEO of an organization who thought it had good equity policies, who thought it had good diversity policies … inside these organizations [the women are describing] the sort of leadership you need from men to be promoted. And that starts to change then the way men think about it inside their organizations."[28] Coalition members continue to work through a proven methodology for increasing the representation of women in their organizations and developing the conditions and cultures that enable them to thrive. They also meet quarterly with the network to share progress, ask questions, support one another in this work, and hold one another accountable.

Dr. Lisa Harvey-Smith, the Australian government's first Women in STEM Ambassador, affirms the importance of systemic change as a means of supporting women's advancement in STEM careers. She notes that corporations need to be focused on changing themselves and their structures and that one effective approach involves networks or outside organizations providing companies with support for change management and rewarding them when they succeed. Employees within the organization will benefit from these changes and will be uplifted to observe change happening.

Sandy Noche, an engineer at Emerson, a global technology and engineering company with operations in the Philippines, described the ways in which having a CEO who embraces diversity and mainstreams a culture of inclusion at all levels of the company has impacted him as a member of the LGBTQ2+ community as well as the women with whom he works. "We have a new CEO now, and one of his main goals is to have women and minorities step up to leadership positions by 2030. It's very evident already in emails that he really wants to have people of minority in leadership positions. He also [makes it clear] that it's not just numbers that need to be thought of – they're really intentional when it comes to letting minorities have a voice at the table. Instead of just taking care of the numbers, they are taking care of the people responsible for those numbers." He shared the ways in which managers have created a supportive atmosphere by listening to women about the barriers they face and working actively to implement women's own suggestions for making improvements. "Being aware of these barriers is one of the first steps that companies can take in order to let women be more visible in the organization and move up into higher roles." "The management listens to what employees suggest and are very active in terms of how we create a safe space in which employees can bring their true selves to work… This culture of trust and respect exists from the bottom all the way to the top of the leadership structure."

FHMoms Founder MK Bertulfo agrees that the "culture of support starts from the top." It is leadership, she argues, that sets the stage for supportive interactions among women in the network. To encourage members of her network to take the time to engage with and support others in the network, Ms. Bertulfo spends a significant amount of time modeling this behavior herself. When new moms join the network and ask "newbie" questions – the sorts of questions that might be disparaged on other sites – Ms. Bertulfo responds to these questions herself. This not only signals to newcomers that their questions are important and valued, but also created a culture of openness, free discussion, and inclusion in which even the founder is an active network member. Ms. Bertulfo works to mainstream inclusive behavior across the network by asking women who land jobs through FHMoms to give back to the

community by answering "newbie" questions and supporting newer members on the site. Members actively contribute in several ways: they provide encouragement and targeted advice when other network members have difficulty finding jobs, and "mystery moms" who are more established in the network and their careers anonymously sponsor newer entrants by paying for their training courses.

"BEING AWARE OF THESE BARRIERS IS ONE OF THE FIRST STEPS THAT COMPANIES CAN TAKE IN ORDER TO LET WOMEN BE MORE VISIBLE IN THE ORGANIZATION AND MOVE UP INTO HIGHER ROLES."

– SANDY NOCHE, SENIOR TEAM LEADER SUPPLY CHAIN, EMERSON


PLYMOVENT
Harry Potter

LIMITATIONS OF NETWORKS

Women-in-STEM networks face a range of operational, programmatic, and structural constraints that limit their ability to achieve their common mission of bringing more women into STEM careers and supporting them to advance in these careers.

The primary operational challenges that networks face are financial and human resource constraints: these can limit the effectiveness and sustainability of networks and pose management challenges as they scale. A lack of diversity within networks can also be a challenge and limit potential — particularly when it means that network members have limited access to powerholders. While all-female networks and entry-level affinity groups play an important role in supporting women to enter and advance in STEM careers, a lack of senior-level representation in the networks can mean that the network has limited power to effect significant or structural change. STEM networks comprised of CEOs and high-level leaders can also be constrained by their lack of diversity: these networks must make a conscious effort to actively engage with and listen to those with less power, including women in STEM positions within their organizations and networks of women in STEM with horizontal links to these organizations, or they too may remain unable to effect transformative change to support women in STEM.

The subsections that follow examine the key operational, programmatic, and structural limitations that women-in-STEM networks face as they work to bring more women into STEM fields and support women to advance in STEM careers.

FINANCIAL CONSTRAINTS

Funding is a major constraint to the ability of networks to achieve their missions and this is the most cited constraint to network operations among network leaders. As an employee of a large tech company who participates in internal women's networks noted, "Funding is a huge one. We have enough funding to run specific events and do a lot of things, but there is always a cap and never enough to do all that we want to do." For non-profit networks that offer free courses or content, funding is a particular challenge, as these networks must either continually secure donor funding or develop a hybrid model whereby for-profit activities subsidize those that are free-of-charge.

HUMAN RESOURCE CONSTRAINTS

Women-in-STEM networks across Asia face significant human resource constraints, as most operate with few, if any, salaried employees. Many non-profit networks, internal corporate networks, and informal networks rely completely on volunteers. Within companies, workers are generally required to prioritize work tasks over network activities, so without dedicated time set aside for network activities and recognition of the importance of these activities by company management, networks can struggle to attract participants. One respondent who both led and participated in women's networks at her workplace noted that it was particularly difficult to get sustained engagement from mid-career women in their late-20s to mid-30s, given their significant workloads and the fact that many are juggling work and childcare and household duties. "By and large, people are so busy that it's not always easy to get folks out," she said.

Volunteers must be trained to ensure that they understand their roles and responsibilities, and this requires time and funding, including resourcing volunteer management. This is a particular concern for network members who serve in management positions or as mentors. Mentorship-based networks, for instance, may need to invest heavily in training volunteers to ensure that volunteers engage their mentees

in ways that are both ethical and supportive of their mentees' professional development. Volunteer burnout can also be a problem for networks that rely heavily on volunteers, and it is generally difficult for networks that rely on volunteers to set up accountability mechanisms to ensure that they follow through on tasks. Even volunteers who are highly committed to the networks' mission may experience changed life circumstances that make it impossible for them to continue their work with the network. The need to nurture, train, and replenish volunteers is a major challenge in mentorship-based networks: individual mentors can only take on a small number of mentees at any given time. This means that if the network is successful in creating strong mentor-mentee relationships, it must continually recruit and retain volunteers.

Networks that rely on volunteers face additional challenges as they scale, including managing a large, remote workforce; ensuring consistency across the global or regional network of volunteers; and maintaining retention among a diffuse staff who may have no in-person contact with headquarters or other network nodes. For instance, She Loves Data began as a small in-person network of professionals in Singapore and has now grown to 16 countries globally and relies on approximately 150 volunteers in 17 cities. To make the network truly sustainable at this scale, Co-founder Jana Marlé-Zizková believes that the organization will need to transition from an all-volunteer structure to include some salaried employees and is also considering a fee-based certification program to help offset the cost of the network's free offerings.

LACK OF DIVERSITY IN NETWORK MEMBERSHIP

All-women STEM networks can be limited in their ability to effect systemic change or advance women's opportunity in settings where they do not have strong linkages to powerholders. All-women networks play an important role in bringing women into STEM fields and supporting women's retention and advancement in those fields by offering safe spaces where women can share experiences, gain confidence, and develop a sense of solidarity and shared identity with others in the group. This is particularly valuable in environments where women may be constrained by harmful gender norms or where they may experience discrimination due to factors such as ethnicity, religion, immigration status, faith, and sexuality. And yet, homophily, or the tendency of people to create connections with others like them, can lead networks to operate in silos, limiting their effectiveness and reach. According to sociologist Nadine V. Kegen, although gender homophily increases the likelihood that network members will forge ties with one another, it can also disadvantage women by isolating them from broader resource flows, particularly in cases where women work in scientific fields with low female representation.[29] All-women networks may thus face constraints in their access to relevant information and opportunities for collaboration, which are essential for success in many scientific fields. According to J-Win's Founder Ms. Yukako Uchinaga, women-only networks frequently have a detailed grasp of the core issues limiting women's participation and leadership in STEM fields, and yet they may not have the power – or access to powerful individuals – to influence and effect change on these issues.

CREATING AUTHENTIC RELATIONSHIPS WITHIN FORMAL NETWORKS

Formal mentorship networks or professional associations may struggle to foster deep and authentic ties among network members, at least in the short term. Mentoring programs that match mentors with mentees from a limited pool are not always able to foster the sorts of deep and enduring bonds that emerge from shared experiences or connections built on friendship. While formal networks have developed a range of techniques to forge such connections – from excursions such as Homeward Bound and hackathon trips, to allowing mentors and mentees to choose one another from a pool of people – interviewees noted that, in some cases, connections forged through formal networks simply fall flat.

STRUCTURAL BARRIERS

A number of structural barriers, including persistent social and cultural norms that disadvantage women, impinge on women-in-STEM networks' ability to achieve their missions. For instance, **gender inequities in caring duties** make it less likely that women will have time to participate in or lead networks, weakening networks' ability to serve these women and weakening the sustainability of the network itself (since it is comprised of women). **Attitudes and gender norms that signal to girls early on that STEM is not for them** lead many girls to drop out of the STEM pipeline before they reach the point at which women-in-STEM networks can support them. Similarly, **biases against hiring women**, for instance due to the perception that they may take time off work for maternity leave or childcare, reduce the pipeline for women-in-STEM networks at the professional level, particularly those based within companies (as women must first be hired to participate in these networks). Gender discrimination in hiring also places a constraint on networks and technical schools that seek to bring more women into STEM fields through technical education: if companies will not hire their graduates, then these networks ultimately cannot achieve their goal of bringing women into STEM careers. In the longer term, this dynamic will impact the financial sustainability of these networks and training centers, as women will be less likely to invest in an education through them if they are unable to demonstrate successful job placements.

Several respondents pointed to the **persistence of traditional hierarchical structures** in domestic companies (when compared with global companies that have offices in the same location), as well as in some public sector and academic settings. In cases where leadership sends a clear signal that diversity, including gender diversity, is not a priority, women-in-STEM networks may find it more difficult to operate publicly and will be subject to greater financial constraints. One respondent who had worked in a domestic company in STEM in East Asia for decades noted that when she first became aware of women-in-STEM networks late in her career, she was at first confused about why a women-focused network would be necessary; she had been involved in many STEM professional networks (which were always overwhelmingly male), and the notion of exploring women's concerns related to STEM careers had never come up.

Finally, the **policy environment** and infrastructure can have significant impacts on the ability of networks to operate. Without **public policies that make it simple for networks to register and operate,** networks will face hurdles in gaining legal status and reaching financial sustainability. Corporate policies can also hinder the operations of internal networks if companies do not provide adequate time, funding, space, and recognition to networks. **Internet connectivity** and other infrastructure challenges can also limit networks' ability to operate and achieve their missions. For instance, FHMoms noted that spotty internet limits women's ability to participate in network conversations, take on remote or platform work, or learn online.

RECOMMENDATIONS

The recommendations that follow suggest measures that may be taken to strengthen the effectiveness and sustainability of women-in-STEM networks in Asia. They include recommendations for networks as well as ways in which private and public sector entities can help sustain and support networks to achieve their missions.

For women-in-STEM networks to be effective, they must address the barriers that women face to entering and advancing in STEM fields, while also ensuring that their content is relevant, they reach a wide audience through outreach, and they are financially sustainable. Government and the private sector have an essential role to play in helping networks thrive by creating a supporting enabling environment for women-in-STEM networks. Public and private sector entities can do this by formulating policies that facilitate the establishment and operation of women-in-STEM networks, allocating resources to networks, and publicly acknowledging the importance of the work that networks are doing. Partnerships with networks also offer a powerful tool for advancing broader DEI objectives at the corporate and national levels. Through sponsorship of and alliances with women-in-STEM networks, private sector organizations and government can gain a deeper understanding of relevant issues, while working through women's own organizations to effect change at a company-wide or national scale. Cross-pollination and collaboration can be especially powerful in tackling complex barriers and effecting structural change.

These recommendations flow from the regional research and build on promising practices in the region. Given the diversity of cultures in Asia, it is recommended that readers consider whether specific recommendations are likely to gain traction in their context and whether specific adaptations should be applied.

Recommendations to support and sustain Women-in-STEM networks and advance STEM equity

WOMEN-IN-STEM NETWORKS

- **Develop a robust sustainability strategy**, including a plan for financial and human resources
- **Meet women where they are**, and lead by example
- **Cultivate gatekeepers**
- Make STEM **affordable**
- **Actively promote** diverse and inclusive network membership
- Make the network a **safe space**
- **Spotlight** successful women in STEM
- **Train network members** who are in mentorship, management, or leadership positions on their roles and responsibilities
- **Leverage powerholders** in the network and the network's collective identity
- **Encourage** network members to participate in multiple networks
- **Contribute** to the creation of an association of women-in-STEM networks

PRIVATE SECTOR COMPANIES

- **Leverage** women-in-STEM networks to drive institutional change
- **Advance** DEI through support for internal networks
- **Create and formalize** opportunities for staff to engage in networks, both internal and external
- **Work with networks** to become more responsive to the needs of women in STEM
- **Engage** STEM networks to upskill employees
- **Create** work placement opportunities for STEM students and graduates
- **Mainstream** flexible work arrangements
- **Foster** the development of an association of women-in-STEM networks and elevate its key initiatives

GOVERNMENT

- **Create a supportive enabling environment** for network creation
- **Partner with networks** to expand the reach of government programs and policies
- **Address** internet connectivity issues
- **Adopt policies** that create an enabling environment for women's participation in STEM
- **Partner with networks** on curriculum development to keep more girls in STEM
- **Catalyze** the development of a 'network of networks for women in STEM' and key initiatives emerging from these networks by launching a STEM Equity Fund

RECOMMENDATIONS FOR WOMEN-IN-STEM NETWORKS

Develop a robust sustainability strategy, including a plan for financial and human resources. Given the funding and human resource constraints that many networks face, it is essential to have a clear sustainability plan. Where there is a heavy reliance on volunteers to lead network activities, run events, or conduct trainings, network leaders should discuss with group members how to leverage existing efforts, avoid duplication, and promote cross-pollination. Develop a core group of members who believe in the importance of the network, accept responsibility for its sustainability, and hold one another accountable; this core group can mutually agree on a set of expectations and accountability structure of their group. For networks that are reliant on volunteers, consider appointing a volunteer coordinator and look at ways to ensure a pipeline of volunteers, as the availability of current volunteers can change and even those who are highly committed may experience burnout. Strategies such as asking current volunteers to bring in one additional volunteer each can support a robust pipeline of human resources to keep the network going. For mentorship rings and other networks that are highly reliant on mentors, recognize that even if mentorships are timebound by the program, successful mentorships will in fact endure, and there is a limit to how many people an individual mentor can ultimately take on. Developing a pipeline of incoming mentors with skills and experience relevant to the network will be essential, together with a structured program and strategy for capturing best mentoring practices and lessons learned.

Meet women where they are, and lead by example. Networks supporting women to enter, engage, and advance in STEM fields should explore the barriers women face to participating in network activities (including time constraints related to work or caring duties, financial barriers, connectivity barriers, and socio-cultural barriers including gatekeepers) and address these through targeted interventions. Consider creating female-only spaces, particularly at the entry level, in fields that are male-dominated or where women historically have had low levels of participation. Network leaders can encourage participation further by establishing a welcoming and inclusive environment in which all network members feel that they are valued members of the group. Leaders can support network members to actively engage in group activities and develop personal and professional skills through these by giving each member a role that she can excel in and by keeping the group's focus on a clear mission.

Cultivate gatekeepers. Recognizing that family members, teachers, school counselors, and other gatekeepers hold significant sway over girls' and women's decisions to enter STEM fields, networks should include programming and activities that target these influencers by helping them better understand the value of STEM education for girls and the diverse range of career opportunities open to women in STEM. This can include messaging that training can lead to stable and high-paying jobs, supported by examples of successful women in STEM and exposure to effective role models.

Make STEM affordable. STEM networks and training programs must actively address financial barriers to make STEM education and careers accessible to women and girls. These include the costs of training programs, materials, equipment, and transportation. Where possible, networks should offer free courses, scholarships, or flexible financing models (including deferring tuition payments until employment). Networks can also partner with government and the private sector to ensure access to STEM education and enrichment programs through scholarship opportunities or training-to-work arrangements.

Actively promote diverse and inclusive network membership. Homophily can lead networks to operate in silos, limiting their effectiveness and reach. Networks should actively reach out to diverse constituencies, including in collaboration with community groups knowledgeable about these constituencies to hone messaging or through direct partnerships with these groups. Networks and partners can hold discussions in which they ask, "what are the reasons that diverse populations are not applying?" and attempt to address these barriers. Where possible, networks should hire a diversity and inclusion staff member to coordinate this work. When bringing diverse people together, networks should also strive to establish an inclusive environment that recognizes participants' differing needs, for instance by making appropriate foods available or ensuring that meetings do not conflict with religious holidays.

Make the network a safe space. Networks should take proactive steps to ensure that they are creating a space where network members feel comfortable to openly ask questions, learn, and develop their skills without fear of judgment or shame. This can include setting out rules for interaction in advance of meetings or limiting the size or composition of the group in certain circumstances. All-female events and training programs – particularly at the entry level – can help bring more girls and women into STEM by providing a safe space to explore a new field. Networks may also want to consider forming all-female groups for discussions of sensitive topics such as harassment in male-dominated STEM fields (and having a qualified professional serve as facilitator). Networks can also leverage the safe space of their meetings to help women practice skills – such as articulating personal achievements – that are essential for success in the broader professional realm.

Spotlight successful women in STEM. Highlighting success stories of women in STEM can help networks elevate the accomplishments of their own members, combat imposter syndrome among women in their network, and create new role models for girls and women (and for gatekeepers). Networks can spotlight the achievements of women in STEM fields and make STEM relatable to a broad range of women and girls through media (including social media), speaking engagements (including public appearances and career talks), awards, and ceremonies.

Train network members who are in mentorship, management, or leadership positions on their roles and responsibilities. Networks should provide adequate and appropriate training to network members, especially those serving in management, leadership, and mentorship capacities, to ensure that they are able to execute their roles effectively and ethically. For example, mentors can be provided with in-person mentorship training (including role playing), a handbook on effective mentoring, and access to a coach for ongoing check-ins. For those in management and leadership positions, particularly in networks comprised of volunteers, it is important to focus on the mission of the organization and the specific expectations of network leaders (including amount of time spent on network activities and other deliverables). Current leadership can then work with prospective leaders and managers to explore the specific skills they bring to the table, how best these could be utilized to further the network's mission and develop a shared understanding of commitments of time and energy.

Leverage powerholders in the network and the network's collective identity. The network constitutes an identity that is greater than the sum of its individual parts. Networks can leverage the power and seniority of certain members of the group to support more junior members, including through advocacy on their behalf. Networks can also leverage the power held by younger members who may be more adept at technology and social media influencing. Collective action on the part of the network can also promote systemic change on issues of collective concern within the group—for instance, through advocacy for more gender-responsive policies within companies, universities, or at the national level.

Encourage network members to participate in multiple networks. Women can benefit from engaging in a range of STEM networks as they progress in STEM careers. For example, intimate all-women networks can provide essential support at difficult moments in one's career or personal life, while networks with a mix of seniority and experience can provide access to professional opportunities. Networks can support women's advancement in STEM careers by acknowledging the distinct and important roles that different types of networks play in women's career advancement and encouraging women to avail themselves of these different opportunities. The cross-pollination of ideas and expansion of network connections that result will benefit the network as well. Networks can support women to effectively leverage multiple networks by providing training on how to network effectively, including through the provision of soft skills training.

Contribute to the creation of an association of women-in-STEM networks. Leveraging The Asia Foundation's Women-in-STEM Network Mapping, networks can connect with other networks and extend and expand their reach and constituencies in support of a network-to-network and a network of networks approach. This may include contributing to the development of a database of women's STEM networks across the Asia-Pacific region. This association, or network of women-in-STEM networks, would facilitate cross-pollination of ideas and strategies for bringing more women into STEM careers and supporting their advancement in STEM fields. The association could also develop conferences or other regional activities that further their member networks' access and reach. The association could be developed in concert with a key entity such as UNESCO as well as governments and the private sector to have the reach, impact, and investment needed.

RECOMMENDATIONS FOR PRIVATE SECTOR COMPANIES

Leverage women-in-STEM networks to drive institutional change. Work with external networks to collect data and analyze the gender makeup of different areas of your organization (both functional and technical), and at all levels of the company (from entry-level, to management, to senior leadership). For instance, some companies in STEM fields such as mining and engineering have relatively high percentages of female employees, however most women work in non-technical areas of the organization, often in lower-paid positions. Management should work from granular data to develop targeted policies that improve gender equality in those parts of the organization where women and LGBTQ2+ individuals are underrepresented. In addition, networks like the Champions of Change Coalition and J-Win that engage and advise corporate leadership on DEI strategies can help companies and leaders to create workplaces that are more open and responsive to women in STEM.

Advance DEI through support for internal networks. Private sector companies can further their DEI initiatives by setting clear DEI policies, values, and objectives and supporting internal women-in-STEM networks that are aligned with these. By recognizing and adequately resourcing these networks (including meeting space, financial support, and formally allowing employees to dedicate a proportion of their time to network activities), companies help to sustain and institutionalize these networks, which in turn promote retention and advancement of women in STEM in the company.

Create and formalize opportunities for staff to engage in networks, both internal and external. Develop a scheme for employees to actively volunteer with the company's support, designate funding for networks, and allocate a proportion of work time that can be dedicated to volunteering. (Interviewees involved in internal corporate networks suggested that a 10 percent allocation of time would be a good objective). Give employees public acknowledgement for this work so that network activities are valued as an essential part of the employee's role and not considered "after work activities."

Create work placement opportunities for STEM students and graduates. Private sector companies can support the entrance of women into STEM careers through apprenticeships and work placement opportunities for students nearing graduation as well as recent graduates. Networks, including industry associations, can help build partnerships between schools and companies through which graduates can undertake 6 to 12-month traineeships that lead to permanent positions and can help socialize employers about the value of hiring women in STEM. Networks can help companies who want to diversify their workforce by bringing women, people with disabilities, LGBTQ2+ individuals and others into the pipeline for positions in coordination with coding schools and training programs that concentrate on these populations. Mentorship programs – whereby mentors from private sector companies provide career advice and support mentees from networks and training programs to transition to the job market – can strengthen this pipeline. Companies can also bring more underrepresented groups into STEM by thinking creatively about work placement opportunities, being flexible in the selection process (including recognition of boot camp and training program credentials) and working with women-in-STEM networks to identify and place women in these positions.

Engage STEM networks to upskill employees. Work with STEM networks and training programs to reskill redundant employees and to upskill current employees in relevant areas with a focus on women. Networks or training schools can tailor the training to the company's needs and hold it onsite. This helps employers retain their existing workforce, while shifting workers

to priority areas; equips women with relevant skills in STEM areas; and provides a for-profit activity for STEM networks to support their sustainability. Upskilling can be done in technical areas and in soft skills (which help guard against automation).

Work with networks to become more responsive to the needs of women in STEM. Private companies can collaborate with or engage networks focused on women in STEM to gain a deeper understanding of the issues inhibiting women's participation in STEM careers or specific companies and work together to develop culturally appropriate and effective responses. For instance, networks representing women in mining could help companies develop supportive approaches that facilitate women's work in remote locations or ways of moving some of these functions online. Companies can also contract networks to directly support their HR departments as they put in place more gender-responsive policies, including flexible work. In addition, companies can engage with scientific academies, industry associations, and other external networks to nominate women in their companies for awards to ensure that women's scientific achievements are recognized both internally as well as externally in public forums.

Mainstream flexible work arrangements. The rapid shift to work-from-home arrangements during the Covid-19 pandemic has made it clear that a range of jobs can be done from home and many more can be done with flexible working hours. Networks can help advise on flexible arrangements that have the potential to bring women and other underrepresented groups into STEM positions through part-time home-based or other flexible work arrangements. Companies should also mainstream such arrangements to retain current workers and support their advancement, including during periods in which employees are juggling work and caring or household responsibilities.

Foster the development of an association of women-in-STEM networks and elevate its key initiatives. Building on the Foundation's Women-in-STEM Network Mapping, private sector entities can partner with civil society and private women-in-STEM networks, and with governments, to encourage and fund an association, or `network of networks for women in STEM,' across Asia and the Pacific. Private sector companies can contribute tools and resources to capture the collective impact and influence that an association, as an umbrella network for women in STEM, can have in shifting power, norms, and funds in support of STEM equity. To catalyze such shifts, private sector companies can also adopt pro-women procurement policies and invest in women-in-STEM companies that provide sought after products and services. An association would enable private sector companies to quickly target their geographic and sectoral priorities and access the expertise required to support better solutions and outcomes.

RECOMMENDATIONS FOR GOVERNMENT

Create a supportive enabling environment for network creation. Provide clear administrative guidance and support for network creation so that women-in-STEM networks can easily register and pursue their mission, without being overly burdened by administrative hurdles. Conduct outreach to networks and associations to ensure that they are aware of the guidelines and understand the process.

Partner with networks to expand the reach of government programs and policies. Governments can work together with networks to ensure that they are reaching their target demographics in programs designed to bring more girls into STEM education and more women into STEM careers. This strategy is particularly important in places where past programs to increase girls' or women's participation in STEM have not gained sufficient traction. Governments can also create set-asides for women-owned STEM businesses, and partner with women's STEM networks to publicize these as well as STEM employment opportunities in government.

Address internet connectivity issues. In several parts of Asia, issues with internet connectivity severely limit women's ability to take on remote or platform work, or to learn online. This includes not only remote islands where there is little coverage, but also some dense cities where people compete for signals. Connectivity issues limit women's access to economic opportunities online, often in areas where there are limited local opportunities. Governments should address internet infrastructure and connectivity issues as an urgent issue, particularly in a pandemic environment, as a means of supporting economic development in these regions, while also working to ensure that women have equal access to the internet.

Adopt policies that create an enabling environment for women's participation in STEM. Government should partner with women's STEM networks to develop an understanding of the problems women in STEM face and work together to formulate policies that address the barriers to women's participation in STEM, for instance through support for flexible working hours and arrangements.

Partner with networks on curriculum development to keep more girls in STEM. Education Departments and Ministries can collaborate with networks and industry associations on curriculum development to ensure that it is relevant to the job market. They can also ensure that teachers have the knowledge and material to teach in rapidly evolving STEM fields and that they understand how to motivate girls to continue their STEM educations. Government can leverage successful network and private sector strategies and marketing approaches to make the STEM curriculum more relatable to youth. In addition, Education Departments and Ministries can coordinate with STEM networks to provide career counselors in high schools with timely information on STEM careers and ways of supporting students to prepare for these careers.

Catalyze the development of a `network of networks for women in STEM' and key initiatives emerging from these networks by launching a STEM Equity Fund. The STEM Equity Fund could be operated by the umbrella network and could include three types of grants: catalyzing, strengthening, and sustaining grants. The catalyzing grants could enable the piloting of new approaches and innovative ideas proposed by network members, including networks working together; the strengthening grants could focus on organizational capacity building (financial, operational, programmatic) of individual networks and cluster networks; and the sustaining grants could enable long-term sustainability of the `network of networks,' including through relationship-building across networks and the development of an overarching learning community.

CONCLUSION

Women-in-STEM networks across Asia are actively creating spaces for exchange, understanding, and advancement that are essential to women and girls in the region.

A key element of their success is their ability to break down the barriers that keep women from entering STEM fields in the first place, or that lead women to decide that STEM is not for them. Networks tackle gender bias, a dearth of female role models in STEM, cultural norms, and gatekeepers that limit access to STEM, and regressive workplace policies. Some networks tackle a single barrier, while others employ a lifecycle approach that addresses the diverse challenges women face as they progress in their careers.

This report has chronicled the array of innovative strategies that networks in Asia are using to bring more girls and women into STEM and to support their success and leadership in STEM careers and documented emerging lessons that require attention and response. Networks are making STEM education accessible to girls through targeted outreach with content girls can relate to and that spurs their engagement with science online. Networks are creating spaces where women can spend a day learning about data, free of charge, with other women whose interest has been piqued on the topic, but who like them, have no experience with data science. Networks are helping women to build confidence in their abilities and vision in their career trajectories. And networks are working at the highest levels of power to push for institutional change, including by insisting that people in power listen to women at all levels in STEM fields about what they really need to succeed.

There are several ways in which the private sector, government, and civil society can support and collaborate with women-in-STEM networks in Asia to advance this work. This includes a commitment to a 'network of networks' for women in STEM. Partnerships that bring different skills and resources to the table can amplify networks' impact and reach — for instance, a collaboration that leverages government training capacity, industry association expertise on cutting-edge science, network outreach to women in STEM, and corporate support for work placement could help bring more women into tech positions at scale. Networks can facilitate applied research, at the nexus of academia and industry. And networks have an important role to play in advising the private sector and government on how best to support women in STEM through institutional and policy change.

The private sector can leverage networks – both external and internal – for advice and technical support to advance corporate DEI initiatives. Internal networks that are aligned with corporate DEI objectives (such as women's advancement in STEM or the recruitment of more women in STEM) can be particularly strong partners. As one interviewee noted, the best recruiting tool for women in STEM is a happy woman in STEM talking about her work at the company. To help internal networks thrive, companies should formally recognize and adequately resource these networks – including through the provision of funding, meeting space, and a dedicated portion of employees' worktime for network activities.

Networks themselves can benefit from increased interaction with one another. This research identified over 70 networks working to support women in STEM education and careers across Southeast and East Asia, many of which are working on similar or overlapping issues, and some of which have already made connections and engaged in productive exchange. These networks would be supported by the creation of an overarching network association to facilitate ongoing interaction and exchange of strategies, approaches, and knowledge. Cross-pollination and collaboration can be a particularly powerful tool for tackling the persistent and structural barriers that women in STEM – and women-in-STEM networks – face, particularly when coupled with injections of financial capital that strengthen networks and the women they serve.

Taken together, the recommendations for networks, the private sector, and government offer a path forward for leveraging the work of women-in-STEM networks and for bolstering their independent and collaborative efforts to close the gender gap in STEM education, entrepreneurship, and employment.

NETWORKS TACKLE GENDER BIAS, A DEARTH OF FEMALE ROLE MODELS IN STEM, CULTURAL NORMS, AND GATEKEEPERS THAT LIMIT ACCESS TO STEM, AND REGRESSIVE WORKPLACE POLICIES.

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THE ASIA FOUNDATION'S WOMEN-IN-STEM NETWORK MAPPING

The Asia Foundation's Women-in-STEM Network Mapping identifies over 70 networks working to support women to enter and advance in STEM careers in Asia.

The mapping includes information on each organization's mission, approach, size, demographics, and funding, as well as whether it operates locally (including within corporations or universities), nationally, regionally, or globally.

Conducted February-March 2021 the mapping was undertaken via a literature review, online research, and local outreach through the Foundation's offices in Southeast and East Asia. While the mapping is extensive, it is neither exhaustive nor representative. We hope it will be a useful resource for women-in-STEM networks, companies, governments, and civil society to enhance support for and collaboration with these networks.

Ada's List

Location:
Global

Geographic focus:
Global

Sector:
Nonprofit

Founding date:
2013

Membership #:
7,800 globally
(4,600 in the UK)

Member focus:
Women and LGBTQ2+ people in tech

Funding source:
Qualcomm

Industry focus:
Technology

Approach:

- Networking/exchanges
- Policymaking
- Community building
- Job search & prep

Ada's List is the place for professional women and non-binary people who work in the tech sector to connect, conspire, and take a stand. Ada's List is for all women (trans, intersex and cis) and all non-binary, agender and gender variant people. It is a visibility platform and marketplace designed to help members to collaborate and progress professionally and seeks to change existing patriarchal and racist power structures. Ada's List is intersectional and aims to provide a platform for a holistic approach to address issues surrounding the under-representation of women in tech; this includes tackling any implicit or explicit bias around gender, race, disability, or sexual orientation. Thousands of women across the world visit the platform every day, engaging with fellow Ada's because they genuinely care about supporting one another, creating impact in their communities and workplaces, and working to change the tech industry for the better. Ada's list manages a jobs channel, hosts networking events, and convenes an annual conference.

https://www.adaslist.co/

Arus Academy, Empowering Girls through Girls in Engineering, Mathematics and Science (GEMS) program

Location:
Malaysia

Geographic focus:
Local

Sector:
Nonprofit

Founding date:
2017

Membership #:
46

Member focus:
Female primary school students

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Training/skill building
- Community building

GEMS aims to empower more primary school girls in robotics and technology. To date, GEMS has impacted 46 girls from primary schools around Alma, Penang. The program includes a series of 40 lessons in which girls engage in problem solving activities, applying scientific principles to solve both theoretical and existing problems. Programming also includes interpersonal leadership training.

https://www.arusacademy.org.my/web/girls-in-engineering-mathematics-science/

Asia and Pacific Nation Network (APNN), International Network of Women in Engineering and Sciences (INWES)

Location:
Asia and Pacific

Geographic focus:
Regional

Sector:
Nonprofit

Founding date:
2008

Membership #:
-

Member focus:
Women scientists and engineers

Funding source:
-

Industry focus:
STEM

Approach:

- Networking/exchanges
- Policymaking
- Community building
- Education support

Formed in 2008, the APNN regional INWES network promotes the goal to build a better future worldwide through full and effective participation of women and girls in all aspects of STEM in Asia and Pacific Nations. Through convening Asian regional INWES meetings, increasing network membership in Asia and Pacific Nations, and promoting the role of women scientists and engineers in the region, APNN works to strengthen the capacity of individuals, organizations, and corporations to influence policies in STEM worldwide, and to encourage the education, recruitment, retention, support, and advancement of professional women and students through an international network of organizations and experts. Areas of focus include: exchange/visiting programs; empowerment/education programs; gathering programs; and gender equality/government policy.

https://www.inwes.org/apnn/

Association of Korean Women Scientists and Engineers (KWSE)

Location:
Korea

Geographic focus:
National

Sector:
Government

Founding date:
1993

Membership #:
1,905

Member focus:
Women scientists and engineers living in Korea

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Job search & prep

KWSE organizes international mentorship programs like the Smart Sister Program (started in 2013) that lay the foundation for networking and academic exchanges between Korean and international women scientists and engineers living in ROK. The program includes mentoring sessions, field trips to research institutes, lab visits, cultural exchanges, research presentations and lectures.

http://kwse.or.kr/eng/main.jsp

Center for Innovation in Engineering Education (CIEE), Ewha Women's University

Location:
Korea

Geographic focus:
Local (Ewha Women's University in Seoul)

Sector:
Nonprofit

Founding date:
2006

Membership #:
-

Member focus:
Female engineers at Ewha Women's University

Funding source:
Ministry of Trade, Industry and Energy and the Korea Institute for Advancement Technology

Industry focus:
Engineering

Approach:

- Mentorship/coaching
- Policymaking
- Training/skill building
- Education support
- Job search & prep

CIEE aims to establish a system to educate and nurture female engineers equipped with professional knowledge and required skills. The center communicates the vision of Ewha Women's University College of Engineering to the outside world, while continuously working on researching and developing engineering education programs. Its goal is to foster female engineers according to each student's needs and to consistently contribute to Korea's industrial development. Utilizing a computer-aided system in which students compile and track their performance results, professors provide in depth counseling and mentorship on students' academic pursuits and careers. The Center also runs the CIEE aid project which fosters emotional growth and academic ability, incorporating engineering knowledge with the study of humanities, social sciences, and philosophy. Through this approach, the center strategically strengthens students' abilities to pursue creative convergence, improve job performance and manage the achievements of our business-education partnerships.

http://www.ewha.ac.kr/ewhaen/intro/organ03.do?uniNo=34

Center for Women in Science, Engineering, and Technology (WISET)

Location:
Korea

Geographic focus:
National

Sector:
Government

Founding date:
2011

Membership #:
-

Member focus:
Korean women in STEM

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Training/skill building
- Job search & prep

In 2004, the National Center for Women in Science, Engineering, and Technology was established and operated various programs for women in STEM. In 2011, the Center for Women in Science, Engineering, and Technology (WISET) was launched, integrating a number of diverse projects for women in science, engineering, and technology. In 2013, WISET was reborn as a comprehensive supporting agency to enhance independence and ensure long-term development of national policy project with the vision.

WISET works on transforming Korea's society into one where 1) female scientists and engineers can readily develop their STEM capabilities that are in demand, 2) the working and social environment does not have barriers to female participation in all areas of the industry and academia, 3) the society realizes the value of the achievements of women in STEM which are essential for Korea's innovation and productivity potential.

https://www.wiset.or.kr/eng/contents/center.jsp

CodingGirls

Location:
Singapore

Geographic focus:
National

Sector:
Nonprofit

Founding date:
-

Membership #:
3,000

Member focus:
Women interested in entering tech fields

Funding source:
Private - donors include: Microsoft, Google, ThoughtWorks, accenture, skyscanner, Keboola, IMB, tableau, and more

Industry focus:
Technology

Approach:

- Training/skill building
- Community building

CodingGirls is an introductory platform for women from all walks of life to connect and learn more about the tech field. It aims to strives to eliminate and lower barriers to entry for women who have little to almost no knowledge in technology but are passionate about cultivating or honing these skills. In addition to being a welcoming community for women who shy away from the tech industry because the common issue of gender bias in the field, CodingGirls provides talks, events and workshops to inspire its members, skills courses for women to build and hone skills to excel in the tech field.

https://codinggirls.sg/

Data for Her

Location:
Malaysia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2019

Membership #:
-

Member focus:
Women in data science

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Education support
- Job search & prep

Powered by The Center of Applied Data Science, Data for Her serves the community by closing the gap in women's participation and data science. In partnership with The National Association of Women Entrepreneurs (NAWEM), Data for Her builds diversity in the data field through gender empowerment (conferences), awareness raising/ education (workshops and training events), and community enhancement (networking mentorship, and education support).

http://www.dataforher.com/

Empire Code

Location:
Singapore, Indonesia, Malaysia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2016

Membership #:
-

Member focus:
Anyone interested in coding between the ages of 3 and 79

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Training/skill building
- Education support

Originally founded as a coding education center and has expanded to include the Empire Code Education for computer science training, Empire Code Launchpad for software development, and Empire Code Loves Back our social enterprise. Empire Code Education is a Singapore Ministry of Education (MOE) approved private school, with teachers holding MOE approvals to teach in local and private schools. The education program offers courses for people aged 3-79 and a Black Belt Coder Certification program for its students.

https://empirecode.co/

Filipina Homebased Moms (FHMOMS)

Location:
Philippines

Geographic focus:
National

Sector:
-

Founding date:
-

Membership #:
-

Member focus:
Pinay moms in online, remote, and freelance work

Funding source:
-

Industry focus:
Technology

Approach:

- Training/skill building
- Community building
- Job search & prep

FHMOMS is the first and largest entrepreneurship and freelancing group for Pinay moms that helps moms who aspire to work from home to gain online, remote employment. PHMOMs started as a Facebook support group and aims to cater to the needs of freelance working Pinay moms. Through courses, trainings, and events the organization and its community support women that want to balance the need to earn and income to support their families and spending time with/caring for their children by working online from home. It also offers discounts to members.

https://fhmoms.com/about-us/

For the Women Foundation

Location:
Philippines

Geographic focus:
National

Sector:
Private

Founding date:
-

Membership #:
-

Member focus:
Women interested in data science and AI

Funding source:
Privately funded, sponsors include Google, Slack, Canva, Telus International, and the Consuelo Foundation

Industry focus:
Technology

Approach:

- Training/skill building
- Community building
- Education support
- Job search & prep

For the Women Foundation provides free data science and AI training for women in an effort to create a community of Filipinas in tech that are empowered to break through career barriers. The organization provides full scholarships for women to engage in intensive tech-skills training to enable upward career mobility. Confidence-building and leadership are a key part of the program. Scholarship recipients are part of a strong cohort that provide support and the beginnings of a women in tech professional network.

https://www.ftwfoundation.org/

Girls in Tech

Location:
Indonesia, Japan, Korea, Singapore, Taiwan, Vietnam

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2011

Membership #:
70,000 globally

Member focus:
Women early in tech careers

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Job search & prep

Girls in Tech (GIT) is a global non-profit that seeks to eradicate gender disparities in high-tech industries and startups by engaging, educating and empowering women who are passionate about technology. From technical courses and leadership bootcamps to hackathons and startup competitions, it is our mission to support women entirely with the access and community they need to succeed in tech.

https://indonesia.girlsintech.org/

https://japan.girlsintech.org/

https://korea.girlsintech.org/about/

https://singapore.girlsintech.org/

https://taiwan.girlsintech.org/

https://vietnam.girlsintech.org/

Girls in Tech - Indonesia

Location:
Indonesia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
-

Membership #:
Global 70,000

Member focus:
Women early in tech careers

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Job search & prep

Girls in Tech (GIT) is a global non-profit that seeks to eradicate gender disparities in high-tech industries and startups by engaging, educating, and empowering women who are passionate about technology. With a global membership of 70,000, GIT offers technical courses and leadership bootcamps to hackathons and startup competitions as part of its mission to support women entirely with the access and community they need to succeed in tech. The Indonesian chapter Girls in Tech – Indonesia organizes mentorship, community building events, workshops, and maintains a job board to build a diverse tech workforce and help members grow in their careers.

https://indonesia.girlsintech.org/

HiddenNoMore, International Visitor Leadership Program (IVLP)

Location:
Global

Geographic focus:
Global

Sector:
Government

Founding date:
2017

Membership #:
-

Member focus:
Women leaders in STEM

Funding source:
Disney Studios, US Department of State

Industry focus:
STEM

Approach:

- Networking/exchanges
- Policymaking
- Training/skill building
- Community building

In 2017 the International Visitor Leadership Program (IVLP) brought 48 women leaders from around the world to the US to explore efforts to prepare women and girls for careers in STEM. An initiative of the US Department of State, the program was inspired by the story of African American women who significantly contributed to NASA launching the first astronaut into orbit in the 1960s, depicted in the film Hidden Figures. In 2018 the program hosted 49 women leaders. Participants joined workshops, networked with leading organizations such as Johns Hopkins Applied Physics and Laboratory, National Geographic, and the Geena Davis Institute, explored best practices for recruitment, training, and development of women and underrepresented groups in STEM, and learned how to institutionalize opportunities for women in their home countries. The program also hosts hackathon events, courses in science and diplomacy, and training on internal and external communication for research teams.

Homeward Bound

Location:
Global

Geographic focus:
Global

Sector:
Nonprofit

Founding date:
2016

Membership #:
-

Member focus:
Young women in STEMM/ environmentalists

Funding source:
-

Industry focus:
STEM

Approach:

- Networking/exchanges
- Training/skill building
- Community building
- Education support

Homeward Bound is a ground-breaking, global leadership initiative that aims to heighten the influence and impact of women in making decisions that shape our planet. Programming centers on women-led expeditions to Antarctica focused on environmentalism, global sustainability, and observing the impact of and combatting climate change. The organization is working to tackle the challenge of science communication and the visibility of women in STEMM and uplift women with STEMM background that are leading for the greater good. Each graduating cohort of participants becomes part of a global network of like-minded women committed to demonstrating a model of leadership (collaborative, inclusive, legacy-minded, trustworthy with assets – people and money) that will influence outcomes for men and women towards a healthier planet, and a sustainable future for us all. Four cohorts have completed the program, a fifth is currently underway (as of March 2021) and the sixth cohort is in the selection procress.

https://homewardboundprojects.com.au/

IEEE Japan Council Women in Engineering Affinity Group (IEEE JC WIE)

Location:
Japan

Geographic focus:
National

Sector:
Private

Founding date:
2005

Membership #:
-

Member focus:
Women who are starting or at the midpoint of careers in engineering

Funding source:
-

Industry focus:
-

Approach:

- Networking/exchanges
- Training/skill building
- Community building
- Job search & prep

IEEE JC WIE focuses on providing leading-edge professional development for women who are starting or at the midpoint of their careers and aims to help female engineers and researchers maximize their potential and shine bright as a beacon in their respective fields.

https://www.ieee-jp.org/japancouncil/affinitygroup/WIE/jp/aboutus/aboutus_j.html

Indonesia Women Information Technology Awareness (IWITA)

Location:
Indonesia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2009

Membership #:
-

Member focus:
Information communications technology sector

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Policymaking
- Training/skill building
- Community building
- Job search & prep

Indonesia Women Information Technology Awareness (IWITA) aims to promote women's role and participation in Indonesia's economic development via information technology. IWITA raises awareness of the opportunities in ICT, advocates for women's interests in ICT with the government, and collaborates with other organization to build capacity of members in ICT. IWITA organizes education activities, manages a library of resources, and publishes informational documents on ICT.

https://www.iwita.id

Institution of Engineers Malaysia (IEM), Women Engineers Section

Location:
Malaysia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2013

Membership #:
8,000 (as of 2016)

Member focus:
Women engineers

Funding source:
-

Industry focus:
Engineering

Approach:

- Networking/exchanges
- Community building

The Women Engineers Section was formed for the purpose of connecting women in the engineering profession and creating alliances among engineering professional bodies to inspire, support and celebrate women engineers in their professional development. The Section has taken on a number of challenges, beginning with an effort to bring many more women engineering students into IEM membership – from around 3,000 in 2013 to nearly 8,000 in 2016. The Section has six chapters located across the economy: Southern, Perak, Penang, Miri, Pahang and Sabah. In addition, the Section surveyed its women members on their experiences in the engineering sector. From there, the section has engaged in outreach to university students, bringing engineering awareness into schools, promoting awareness through a gender equality essay contest, and other efforts to build camaraderie and resilience among its members.

https://www.myiem.org.my/content/women_engineer-258.aspx

Japan Network of Women Engineers and Scientists (JNWES)

Location:
Japan

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2002

Membership #:
-

Member focus:
Female engineers and scientists

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Community building
- Education support
- Job search & prep

JNWES is an organization member of INWES (International Network of Women Engineers and Scientists) and is a hub of a global network of Japanese female engineers and scientists. JNWES runs exchanges between female engineers and scientists from Japan and around the world, as well as facilitates cooperation, support and other activities. The organization supports the career development and promotes science and engineering to female junior high and high school students who will lead the future.

http://www.jnwes.org

Japan Women's Innovative Network (J-Win)

Location:
Japan

Geographic focus:
National

Sector:
Nonprofit

Founding date:
-

Membership #:
-

Member focus:
Female executives, senior managers, and high potentials

Funding source:
-

Industry focus:
-

Approach:

- Mentorship/coaching
- Networking/exchanges
- Community building
- Job search & prep

J-Win runs three women leaders networks for executives, senior managers, and high-potentials. These networks work synergistically to develop and support women leaders in japan at each state of the career journey to the TOP! J-WIN also works with corporations to promote diversity and inclusion.

https://j-win0.jp/

Korea IT Business Women's Association (KIBWA)

Location:
Korea

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2001

Membership #:
-

Member focus:
Women in IT

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Job search & prep

Established in 2001, KIBWA supports woman-owned SMEs in the ICT sector as well as greater competitiveness of these businesses through development of resources for women. The association connects women in the sector, introducing them to leaders and role models. The association has three branches: in Seoul, Daegu/Gyeongbuk and in Gyeonggi. Specific activities include hosting conferences for women in ICT and holding competitions for creative problem-solving. KIBWA also manages a mentoring project to support female students who are studying science and engineering and also supports Girls in ICT Day by holding a workshop session on "How to Launch ICT Venture Business." The association also builds cross-border connectivity for women in ICT in collaboration with the Trade Association of Information Technology and the Mobile Technology Convergence Centre. This project explores opportunities for technical and marketing cooperation between Indian and Korean businesses in ICT.

https://www

Korean Federation of Women's Science and Technology Associations (KOFWST)

Location:
Korea

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2003

Membership #:
75,000 members from 69 organizations

Member focus:
Members of women science and technology organizations

Funding source:
-

Industry focus:
STEM

Approach:

- Networking/exchanges
- Policymaking
- Education support
- Job search & prep

KOFWST is a leading federation of women science and technology associations composed of 69 member organizations in the field of science and technology. KOFWST's priority is to foster a harmonious environment for both genders by providing support and guidance to empower women in science and technology. Activities include fostering international collaboration, gender research, and educational opportunities for migrant youth.

http://www.kofwst.org/eng/index.php

Korean Women in Mathematical Sciences (KWMS)

Location:
Korea

Geographic focus:
National

Sector:
-

Founding date:
2004

Membership #:
286

Member focus:
Women in mathematics

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Policymaking
- Community building
- Education support
- Job search & prep

KWMS serves as a voice for female mathematicians in Korea. The organization works to enhance leadership diversity in academic and scientific institutions, promote fairness in competitive selections, and participate in government committees for writing and reviewing policies. Activities include a newsletter, annual conference, workshops for networking and leadership, prizes and awards, travel grants to young women scholars, career services, and outreach programs including public lecture and mentoring programs.

Lean In Singapore Women in Life Sciences/Healthcare Circle

Location:
Singapore

Geographic focus:
Local

Sector:
-

Founding date:
-

Membership #:
163

Member focus:
Women in life sciences and healthcare

Funding source:
-

Industry focus:
Science

Approach:

- Mentorship/coaching
- Networking/exchanges
- Community building

Women in Life Sciences/Healthcare Singapore is set up to empower, inspire and support professional women in the life sciences and healthcare industries, which include the biomedical, biotechnology, diagnostic, health informatics, healthcare, medical device and pharmaceutical sectors. We want to provide a collaborative platform for individuals in the same industry and build a network of women who can lean on each other, to help each other achieve our professional and personal goals. We organize bimonthly meetings for members to come together, discuss issues that women commonly face in their personal lives or the workplace and find ways to overcome them. Discussion topics are championed by a circle member who will then have the opportunity to lead the session. We highly value confidentiality and aim to be a safe and inclusive space for women to share their thoughts and opinions.

https://leanin.org/circles/women-in-life-sciences-healthcare

LinuxChix

Location:
Global; regional chapter in Indonesia

Geographic focus:
Regional

Sector:
n/a

Founding date:
1999

Membership #:
1,000+ globally

Member focus:
Free software users and developers

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building

LinuxChix is an international community of women Free Software users and developers. It is an alternative to the locker room atmosphere found in some online technical forums where women developers that are new to Linux can ask questions. LinuxChix two core rules: be polite and be helpful. LinuxChix is now many things to many people, but it remains primarily a group for supporting women in computing, specifically in Open Source/Free Software/Software Libre computing. LinuxChix has been continually active since 1999, and its mailing lists have attracted over one thousand members worldwide. In addition, it has over fifteen active regional chapters.

https://www.linuxchix.org/

National Association for Women Entrepreneurs of Malaysia (NAWEM)

Location:
Malaysia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
1993

Membership #:
-

Member focus:
Women entrepreneurs in manufacturing, IT, aerospace, engineering, and more

Funding source:
-

Industry focus:
n/a

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building

The National Association for Women Entrepreneurs of Malaysia (NAWEM) unites female entrepreneurs in the fields of manufacturing, IT, aerospace, engineering, and more. The organization fosters both personal growth and business networking connections, and it provides members with opportunities to participate in international and community-based conventions, conferences and mentorship events.

https://nawem.org.my/

PyLadies

Location:
Global; chapters in Vietnam, Singapore, Taiwan, Japan, and South Korea

Geographic focus:
Global

Sector:
-

Founding date:
-

Membership #:
-

Member focus:
Women and LGBTQ2+ people working with python

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Training/skill building
- Community building
- Job search & prep

PyLadies is an international mentorship group for marginalized genders, such as but not limited to non-binary people, trans people, and women in tech, with a focus on helping its community become active participants and leaders in the Python open-source community. PyLadies' mission is to promote, educate and advance a diverse Python community through outreach, education, conferences, events and social gatherings.

https://pyladies.com/

Science, Technology, Research and Innovation for Development (STRIDE) Program

Location:
Philippines

Geographic focus:
National

Sector:
Non profit

Founding date:
2013- 2021

Membership #:
-

Member focus:
-

Funding source:
USAID

Industry focus:
Science, Technology, Research and Innovation

Approach:

- Networking/exchanges
- Training/skill building
- Community building
- Education support

Science, Technology, Research and Innovation for Development (STRIDE) is a United States Agency for International Development (USAID) Philippines initiative that strengthens the country's science, technology, and innovation (STI) capacity as a driver for inclusive economic growth.

https://stride.org.ph

She Loves Data

Location:
Singapore, Indonesia, Malaysia, Cambodia and Vietnam

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2016

Membership #:
8,500 globally

Member focus:
Women interested in pursuing careers in data and technology

Funding source:
-

Industry focus:
Technology

Approach:

- Training/skill building
- Community building
- Job search & prep

Started in Singapore, She Loves Data now has local chapters around the world, including in Indonesia, Malaysia, Cambodia, and Vietnam. The organization encourages women to pursue careers in data and technology by helping them learn about data as well as build the diverse community and tools to thrive. She Loves Data hosts events, workshops, and manages a jobs board. The organization has trained over 8,500 women.

https://www.shelovesdata.com/

Singapore Women in Science

Location:
Singapore

Geographic focus:
National

Sector:
-

Founding date:
-

Membership #:
-

Member focus:
Women in STEM

Funding source:
-

Industry focus:
STEM

Approach:

- Networking/exchanges
- Community building

The Singapore Women in Science network is a national network of women working in science, technology and academia. The organization acts as a support group, facilitating collaboration, mentorship and friendships. Members have exposure to networking opportunities with leaders in the field. Singapore Women in Science strengthens its network by hosting regular events such as monthly talks by professional women who hold diverse leadership positions in the field of science.

https://www.singaporewomeninscience.org

SingHealth Duke-NUS Women in Science Network - WinS

Location:
Singapore

Geographic focus:
National

Sector:
Academia

Founding date:
2017

Membership #:
-

Member focus:
Women in science and academic medicine

Funding source:
-

Industry focus:
Science

Approach:

- Mentorship/coaching
- Networking/exchanges
- Community building

Launched in March 2017, the WinS Network provides a platform to connect the women in science and academic medicine in the SingHealth Duke-NUS Academic Medical Centre (AMC) community. The WinS Network welcomes any woman on campus who considers herself a "woman-in-science" to join our activities centered on the following objectives: providing opportunities for professional development and training through targeted training workshops or open seminars; encouraging regular networking and peer support through social media or via email communications; facilitating social events to promote friendship amongst the community; building mentoring relationships between senior and junior women academic and clinician researchers.

https://www.mbi.nus.edu.sg/education/outreach/mbi-women-in-science/

STEM Career Path Project for Girls

Location:
Japan

Geographic focus:
National

Sector:
-

Founding date:
-

Membership #:
-

Member focus:
Female junior and senior high school students

Funding source:
-

Industry focus:
-

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Job search & prep

Provides opportunities for girls in junior and senior high schools to directly and excitingly learn science and technology. Programming includes a 3-day training camp "Summer school" that connects school-aged girls with women undergraduate students and professionals in STEM fields.

https://www.gstem-cpp.or.jp/english

STEM Girls Ambassadors in the Gender Equality Bureau Cabinet Office

Location:
Japan

Geographic focus:
National

Sector:
Government

Founding date:
-

Membership #:
-

Member focus:
Female K-12 students

Funding source:
-

Industry focus:
-

Approach:

- Mentorship/coaching
- Networking/exchanges
- Community building

The Gender Equality Bureau of the Cabinet Office plays a central role in supporting female junior and senior high school students and female students who are interested in science and engineering fields. Programming to promote women's participation in STEM fields includes the Science and Technology Women's Support Network, Rikochare support groups for universities and companies, and STEM Girls Ambassadors program that gives lectures and hold events at local governments and schools.

StemPower our Girls

Location:
Philippines

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2018-2019

Membership #:
120 (Grade 5 students (11 years old))

Member focus:
Female high school students

Funding source:
Investing in Women by the Australian Government

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Training/skill building
- Community building

#STEMPower Our Girls is a social impact program implemented by Philippine Business for Education (PBEd) and the communications firm Evident Communications - which seeks to solve the low number of female scientists in the country. The campaign is funded by the Investing in Women initiative from the Australian Government. #STEMPower Our Girls aims to empowering eleven-year old girls to pursue STEM-related courses in high school.

https://www.facebook.com/stempowerourgirls

StrongHer - Nokia

Location:
Global, Southeast Asia

Geographic focus:
Global

Sector:
Private

Founding date:
2011

Membership #:
3,000+ globally

Member focus:
Women in tech (at Nokia)

Funding source:
Nokia

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building

StrongHer is an inclusive employee network aiming at a company where women have the same opportunities as men and are well represented in all business domains and functions. Initiated and led by employees for employees, StrongHer is a multi award-winning initiative which contributes to women's empowerment, helping them unleash their potential and magnify their business contribution, and increase the representation of women at all levels and in all job functions in Nokia. StrongHer offers networking opportunities, personal development, and a think-tank on leadership and management. The network is open to all employees of Nokia, including men, women, executives, and non-executives, operating in 70 countries, with 43 active chapters, including in Southeast Asia.

https://www.nokia.com/about-us/sustainability/strongher/

SuriJoshi (Math Girls)

Location:
Japan

Geographic focus:
National

Sector:
-

Founding date:
-

Membership #:
-

Member focus:
Female K-12 students

Funding source:
-

Industry focus:
-

Approach:

- Training/skill building
- Community building

Suri-Joshi is a community for girls studying mathematics. The network aims to foster an interest in mathematics and to empower women to work in all areas, regardless of their level of mathematics. They publish a bimonthly math magazine that acts as a bridge for K-12 students and mathematicians.

https://www

TechLadies

Location:
Singapore

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2016

Membership #:
-

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Job search & prep

TechLadies is a community-led initiative for women to connect, learn, and grow in the tech industry as software engineers, product managers, data scientists, and UI/UX designers. It aims to increase diversity in tech; it has created a space where women can learn technical skills and switch careers into the tech industry. Organized into local chapters, TechLadies offers mentorship programs, training bootcamps, events, and an online community.

https://techladies.co/

TechSprint

Location:
Malaysia

Geographic focus:
Regional

Sector:
Nonprofit

Founding date:
-

Membership #:
-

Member focus:
Women early in tech careers

Funding source:
-

Industry focus:
Technology

Approach:

- Training/skill building
- Education support
- Job search & prep

TechSprint trains and supplies the industry with highly skilled women who undergo technology programs, with the mission to increase the number of women in Technology in Malaysia and around the region. TechSprint offers courses, coding workshops, free webinars, and customized programs (for companies) to help women in Malaysia and the surrounding region fast-track their careers in technology.

https://techsprint.academy/

The Committee on the Advancement of Women Chemists (COACh)

Location:
Global; programs in Cambodia, China, Indonesia, Japan, Laos, Malaysia, Myanmar, South Korea, Thailand, and Vietnam

Geographic focus:
Global

Sector:
Nonprofit

Founding date:
1997

Membership #:
22,000+ globally

Member focus:
Women scientists and university STEM departments

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Policymaking
- Training/skill building
- Community building
- Job search & prep

COACh is a grassroots organization of scientists and engineers working to ensure that all who seek careers in science and engineering have an equal opportunity to achieve their career aspirations and become leaders and role models for the next generation of scientists and engineers to come. In 2011 COACh expanded its reach internationally with an emphasis on scientists and engineers in developing countries. COACh efforts take a two-pronged approach: to provide career building and career development workshops for under-represented groups in STEM and to assist institutions in their STEM diversity and inclusion efforts. The COACh research team is engaged in survey and interview research that helps institutions to identify where problems exist. Career-building workshops include training in leadership, negotiation, effective scientific and workplace communication, mentorship, networking, entrepreneurship, career launch, publishing and grant writing.

https://coach.uoregon.edu/index.php/

The Organization for Women in Science for the Developing World (OWSD), China

Location:
China

Geographic focus:
National

Sector:
-

Founding date:
2009

Membership #:
30

Member focus:
Women scientists

Funding source:
UN

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Education support
- Job search & prep

Founded in 1987, OWSD a program unit of UNESCO and is the first international forum to unite eminent women scientists from the developing and developed worlds with the objective of strengthening their role in the development process and promoting their representation in scientific and technological leadership. OWSD provides research training, career development and networking opportunities for women scientists throughout the developing world at different stages in their careers. Programs include early career and PhD fellowships, and full PhD scholarships.

https://owsd.net/network/china

The Organization for Women in Science for the Developing World (OWSD), Indonesia

Location:
Indonesia

Geographic focus:
National

Sector:
-

Founding date:
2018

Membership #:
114

Member focus:
Women scientists

Funding source:
UN

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Education support
- Job search & prep

See The Organization for Women in Science for the Developing World (OWSD), China

https://owsd.net/network/indonesia

The Organization for Women in Science for the Developing World (OWSD), Malaysia

Location:
Malaysia

Geographic focus:
National

Sector:
-

Founding date:
2011

Membership #:
97

Member focus:
Women scientists

Funding source:
UN

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Education support
- Job search & prep

See The Organization for Women in Science for the Developing World (OWSD), China

https://owsd.net/network/malaysia

The Organization for Women in Science for the Developing World (OWSD), Myanmar

Location:
Myanmar

Geographic focus:
National

Sector:
-

Founding date:
2018

Membership #:
37

Member focus:
Women scientists

Funding source:
UN

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Education support
- Job search & prep

See The Organization for Women in Science for the Developing World (OWSD), China

https://www.facebook.com/owsdmyanmar

The Society of Taiwan Women in Science and Technology (TWiST), International Network of Women in Engineering and Sciences (INWES)

Location:
Taiwan

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2011

Membership #:
150

Member focus:
Women scientists and technologists

Funding source:
-

Industry focus:
STEM

Approach:

- Networking/exchanges
- Community building
- Education support

TWiST aims to encourage and motivate women to participate in STEM fields; promote women's professional status in STEM fields; strengthen the connection among women in STEM through networking; and build international networks for women in STEM fields. Main activities include general assembly and annual meetings; regional gatherings; symposia for women scientists; TWiST Grants for young female scientists; Mentor-Mentee Program for members as well as friends of members; and publishes e-newsletters for female scientists and technologist in Taiwan. TWiST is an organizational member of the International Network of Womenin Engineering and Sciences.

http://twist.org.tw/en/

Unilab Foundation

Location:
Philippines

Geographic focus:
National

Sector:
Non profit

Founding date:
2011

Membership #:
-

Member focus:
Women in STEM, young Filipinas, and industry leaders

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Policymaking
- Training/skill building
- Community building
- Education support

The Unilab Foundation develops social innovations in mental health and well being and STEM education and careers, leading many programs for STEM education and careers. STEM+ PH is Unilab Foundation's flagship program that helps build a future-ready Philippines, by enabling innovators to create solutions for development problems using integrated STEM principles. The Center for Integrated STEM Education in the Philippines (CISTEM) is another program run by The Foundation that aims to strengthen inclusive STEM education through capacity building for teachers and educational institutions, curricular innovations, maximized network linkages, and learner empowerment. Powered by STEM+PH, Pinays Can STEM is a third program that empowers and encourages young Filipinas to pursue their STEM dreams while inspiring other girls everywhere, anywhere. STEM Leadership Alliance-Philippines (SLA-PH) is another broad coalition of industry leaders, educators, government, development partners, non-profit organizations, and corporate foundations committed to help strengthen integrated STEM education in the Philippines. Inspired by STEM Leadership Alliance-US, SLA-PH is convened by the Unilab Foundation, Inc. and serves as its current secretariat.

https://www.facebook.com/STEM.phRocks/
https://www.unilabfoundation.org/programs/100/center-for-integrated-stem-education-in-the-philippines-spin-off

Untapped

Location:
Philippines

Geographic focus:
National

Sector:
Nonprofit

Founding date:
-

Membership #:
-

Member focus:
Women and youth interested in STEM

Funding source:
-

Industry focus:
STEM

Approach:

- Networking/exchanges
- Training/skill building
- Community building

Untapped is a youth-led non-profit organization that aims to bridge the social and gender gaps in STEM fields. As a network of social change for women, youth, and the underprivileged in the STEM industry, Untapped was founded by students and works to acknowledge/empower underrepresented communities in STEM fields, provide education opportunities, and bridge social and gender gaps.

https://untappedph.org/

Virtualahan

Location:
Philippines

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2015

Membership #:
500+ graduates

Member focus:
Persons with chronic, genetic, neuro-divergent, and physical disabilities who are early in their careers

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Policymaking
- Training/skill building
- Job search & prep

Virtualahan is the pioneering and globally awarded virtual school for Persons with Disabilities to develop skills and mindset to become competitive employees and entrepreneurs using the equalizing power of technology. Virtualahan designed a cost-effective and transferable social technology that allows socially excluded populations to access work in the global digital economy. Virtualahan is using computers and the internet to advance their mission of getting people out of poverty by building the future of work where no one is left behind.

https://virtualahan.com/

WeTech

Location:
Global, Asia

Geographic focus:
Regional

Sector:
Nonprofit

Founding date:
2013

Membership #:
-

Member focus:
Women and girls interested in STEM careers

Funding source:
Qualcomm

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Education support
- Job search & prep

WeTech is a consortium of dedicated partners that is led by the Institute of International Education (IIE) to design and support innovative activities to provide training, build networks and offer professional opportunities. WeTech helps women and girls enter and succeed in technology careers, with the goal of enhancing women's talent and skills needed to fuel technological and economic growth. Launched at the Clinton Global Initiative Annual Meeting in 2013, WeTech has engaged with 27 companies, 200 mentors, 50 schools and universities, and 5,000 girls in 18 countries to date. WeTech works with a range of partners to build a healthy pipeline of girls and women in tech fields by linking them to opportunities that will inspire, engage and support them for entrance and success in high-paying tech careers. WeTech's scholarship program currently operates in China, Taiwan, and South Korea; it couples funding with internships or mentorships with leading tech companies.

https://www.iie.org/Programs/WeTech/About

Wildbound

Location:
China

Geographic focus:
Global

Sector:
Private

Founding date:
2017

Membership #:
-

Member focus:
Women in STEM-oriented academia

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Policymaking
- Training/skill building
- Community building

In 2017 the International Visitor Leadership Program (IVLP) brought 48 women leaders from around the world to the US to explore efforts to prepare women and girls for careers in STEM. An initiative of the US Department of State, the program was inspired by the story of African American women who significantly contributed to NASA launching the first astronaut into orbit in the 1960s, depicted in the film Hidden Figures,. In 2018 the program hosted 49 women leaders. Participants joined workshops, networked with leading+D7 organizations such as Johns Hopkins Applied Physics and Laboratory, National Geographic, and the Geena Davis Institute, explored best practices for recruitment, training, and development of women and underrepresented groups in STEM, and learned how to institutionalize opportunities for women in their home countries. The program also hosts hackathon events, courses in science and diplomacy, and training on internal and external communication for research teams.

WiTech (Youth for Women in Technology Inc.)

Location:
Based in the Philippines with 14 chapters around the world

Geographic focus:
National

Sector:
Non profit

Founding date:
2016

Membership #:
-

Member focus:
Female high school and university students

Funding source:
Various private companies (https://wi-tech.org/partner-companies-orgs/)

Industry focus:
Technology, STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Training/skill building
- Community building
- Education support

WiTech (Youth for Women in Technology Inc.) is a registered nonprofit organization based in the Philippines that aims to educate, inspire, and empower Filipino youth to break gender barriers and use technology to make a difference in society. The WiTech team has led numerous projects including the first two Women in Tech Conferences (WiTCon) in the Philippines, Women in Tech Teach programs (Wi-Teach), WiTalks, Wi-Reach, and Campus RoadShow. Moreover, the WiTech blog (www.wi-tech.org) has garnered over 44,200 blog views from 100+ countries.

https://www.facebook.com/witech.org http://wi-tech.org/

Women in Computing (WIC), Computing Society of the Philippines

Location:
Philippines

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2015

Membership #:
-

Member focus:
Women in universities pursuing computing degrees

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Training/skill building
- Community building
- Education support
- Job search & prep

In coordination with the Association for Computing Machinery, WIC encourages the enrollment and completion of computing degrees among women in the Philippines. WiC hosts annual conferences that connect women in computing, provides space for industry leaders to present their work, holds educational panels, and funds scholarships and grants for exceptional women in computing.

https://sites.google.com/site/roxasreo/home/community-engagement/wic

Women in Mining and Energy (WIME)

Location:
Indonesia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2019

Membership #:
-

Member focus:
Women in mining and energy

Funding source:
-

Industry focus:
-

Approach:

- Mentorship/coaching
- Networking/exchanges
- Policymaking
- Training/skill building

Women in Mining and Energy (WIME) is a strategic hub that aims to initiate a partnership with companies, government and other relevant stakeholders through education and knowledge management to benefit advocacy effort on gender in mining and energy sector. Through public discussion to share best practices and mentorship, WIME works for gender mainstreaming in mining and energy. The goal of the initiative is to increase the participation of women in the sector, and ultimately to promote equal rights, opportunities and benefits for both men and women to help them pursue sustainable livelihoods in mining and energy.

Women in Nuclear Korea (WiN Korea)

Location:
Korea

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2000

Membership #:
500

Member focus:
Women in nuclear energy and radiation

Funding source:
-

Industry focus:
Science

Approach:

- Networking/exchanges
- Community building

WiN Korea is a nonprofit organization which has about 500 women experts working in the field of nuclear energy and radiation, such as nuclear industries, research institutes, regulatory authorities, medicine and health care in Korea. Members of WiN Korea pursue to share their knowledge and experiences for the public and contribute to the social community through outreach activities to enhance the understanding and public awareness of nuclear energy and radiation application. WiN Korea is a national Chapter of Women in Nuclear Global (WiN Global), a global network of more than 35,000 members from 120 countries (national Chapters) and international organizations. The members have a common commitment to provide information and communicate with the public, especially for women and next generations to promote a better understanding of nuclear science.

https://www.winkorea.or.kr/eng/introduction/introduction_01.jsp

Women in Science and Healthcare (WISH), Yong Loo Lin School of Medicine, National University of Singapore

Location:
Singapore

Geographic focus:
National

Sector:
Academia

Founding date:
-

Membership #:
-

Member focus:
Gradate students, staff, post doctoral fellows, and faculty

Funding source:
-

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Networking/exchanges
- Community building

Women in Science and Healthcare (WISH) at the National University of Singapore is an organization of graduate students, staff, post-doctoral fellows and faculty dedicated to achieving equity and full participation of women in all areas of science. The goal of WISH is to advance women in science and to raise awareness with the research community aware of past, present and future challenges facing women in STEM. WISH seeks to increase the participation of women in science at all levels, and to enable the advancement and success of women scientists. WISH members are involved in mentorship, networking and outreach—from participation in seminars and discussions, to the conception, creation and deployment of our inaugural symposium, BIOS, founded in 2015.

https://www.mbi.nus.edu.sg/education/outreach/mbi-women-in-science/

Women in Science Working Group, Global Young Academy (GYA)

Location:
Global

Geographic focus:
Global

Sector:
Nonprofit

Founding date:
2014

Membership #:
200

Member focus:
Young, high-achieving scientists 3-4 years out of PhD programs, aged 30-40

Funding source:
-

Industry focus:
STEM

Approach:

- Policymaking
- Training/skill building
- Community building

The GYA provides a rallying point for outstanding young scientists from around the world to come together to address topics of global importance. GYA develops, connects, and mobilizes young talent from six continents and empowers young researchers to lead international, interdisciplinary, and inter-generational dialogue with the goal to make global decision-making evidence-based and inclusive. The Women in Science Working Group aims to have the voice of women scientists widely heard to reach policy and decision makers with the target of a better future for female scientists. Activities include rigorous research, capacity-building, and conferences.

https://globalyoungacademy.net/activities/women-in-science/

Women in STEM Workforce Readiness Program

Location:
Philippines

Geographic focus:
National

Sector:
Nonprofit

Founding date:
1 September 2017 - 1 December 2020

Membership #:
-

Member focus:
Women early in STEM careers

Funding source:
JPMorgan Chase Foundation International Labour Organization (ILO)

Industry focus:
STEM

Approach:

- Mentorship/coaching
- Training/skill building
- Community building
- Job search & prep

The Women in STEM Workforce Readiness Program, funded by JPMorgan Chase Foundation, seeks to provide women with critical soft and technical STEM-related skills, employability and leadership training coupled with targeted mentorship to help women gain quality employment and advancement opportunities in STEM-related jobs.

https://www.ilo.org/manila/projects/WCMS_617632/lang--en/index.htm

Women in Technology International (WITI)

Location:
Global; networks in Japan, Singapore, and Thailand

Geographic focus:
Global

Sector:
-

Founding date:
1989

Membership #:
-

Member focus:
Women and men in tech committed to inclusivity

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Policymaking
- Community building
- Job search & prep

WITI is committed to empowering innovators, inspiring future generations and building inclusive cultures, worldwide. WITI hosts Profession, Corporate, and Industry-based Networks that offer members connections, resources, and opportunities to excel in their field and forge a more inclusive culture. Members represent every career stage.

https://witi.com/

Women in Tek Network (WTN)

Location:
Cambodia

Geographic focus:
Local (Phnom Penh)

Sector:
Nonprofit

Founding date:
-

Membership #:
-

Member focus:
Young women tech entrepreneurs

Funding source:
USAID/Pact

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Policymaking
- Training/skill building
- Community building

The Women in Tek Network (WTN) was established through the USAID-funded PACT WE Act program to support women entrepreneurs. Organized by The Asia Foundation, WTN provides a needs-based, timely, and tailor-made set of integrated activities to support young women entrepreneurs (YWEs) working in technology through networking, mentorship, and business coaching.

https://tek4good.org/women-in-tek-network/about

Women Who Code (WWCode) - Beijing

Location:
China

Geographic focus:
Local (Beijing)

Sector:
Nonprofit

Founding date:
2015

Membership #:
2,410

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Job search & prep

Women Who Code started as a community group in 2011 when a handful of technologists decided they wanted to change the industry experience for women engineers. Since then, it has become a global non-profit organization and the world's largest and most active community dedicated to inspiring women to excel in technology careers. One city at a time, Women Who Code spread around the world, reaching more than 20 countries. WWCode provides technical training, career, and leadership workshops, as well as hackathons and conferences, all designed to inspire women engineers in the area and help them to excel in their careers.

https://www.womenwhocode.com/beijing

Women Who Code (WWCode) - Kuala Lumpur

Location:
Malaysia

Geographic focus:
Local (Kuala Lumpur)

Sector:
Nonprofit

Founding date:
2014

Membership #:
1,210

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Job search & prep

See Women Who Code (WWCode) - Beijing

https://www.womenwhocode.com/kl

Women Who Code (WWCode) - Manila

Location:
Philippines

Geographic focus:
Local (Manila)

Sector:
Nonprofit

Founding date:
2016

Membership #:
2,756

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Job search & prep

See Women Who Code (WWCode) - Beijing

https://www.womenwhocode.com/manila

Women Who Code (WWCode) - Seoul

Location:
Korea

Geographic focus:
Local (Seoul)

Sector:
Nonprofit

Founding date:
2019

Membership #:
152

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Job search & prep

See Women Who Code (WWCode) - Beijing

https://www.womenwhocode.com/seoul/about

Women Who Code (WWCode) - Singapore

Location:
Singapore

Geographic focus:
Local (Singapore)

Sector:
Nonprofit

Founding date:
2016

Membership #:
3,436

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Job search & prep

See Women Who Code (WWCode) - Beijing

https://www.womenwhocode.com/singapore

Women Who Code (WWCode) - Taipei

Location:
Taiwan

Geographic focus:
Local (Taipei)

Sector:
Nonprofit

Founding date:
2016

Membership #:
2,611

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Mentorship/coaching
- Networking/exchanges
- Policymaking
- Training/skill building
- Community building
- Education support
- Job search & prep

See Women Who Code (WWCode) - Beijing

https://www.womenwhocode.com/taipei

Women Who Code (WWCode) - Tokyo

Location:
Japan

Geographic focus:
Local (Tokyo)

Sector:
Nonprofit

Founding date:
2016

Membership #:
2,077

Member focus:
Women in tech

Funding source:
-

Industry focus:
Technology

Approach:

- Networking/exchanges
- Job search & prep

See Women Who Code (WWCode) - Beijing

https://www.womenwhocode.com/tokyo

Women's Laboratory Venture Innovation Group, Sookmyung Women's University

Location:
Korea

Geographic focus:
National

Sector:
Government

Founding date:
-

Membership #:
-

Member focus:
Female university and graduate school students

Funding source:
Ministry of Trade, Industry and Energy and the National Research Foundation of Korea

Industry focus:
Technology

Approach:

- Training/skill building
- Community building
- Education support
- Job search & prep

Part of the Korea Innovation Corps Program, the group supports students and/or fellows affiliated with a university lab to lead technology commercialization. The program promotes technology startup exploration and "Lab-to-Market" type technology start-up education. It aims to solve socio-economic problems facing women in start-ups and their careers through focusing on women's entrepreneurship, supporting graduate students and researchers, and promoting women-led technology startup culture. Five universities were selected to participate in the program across the country, including Sookmyung Women's University (the only women's University).

http://sme2f.sookmyung.ac.kr/menu/viewMenu?menuid=001006001

WSTEM - Mongolia

Location:
Mongolia

Geographic focus:
National

Sector:
Nonprofit

Founding date:
2011

Membership #:
-

Member focus:
Mongolian women scientists and girls

Funding source:
-

Industry focus:
STEM

Approach:

- Networking/exchanges
- Policymaking
- Community building

WSTEM Mongolia works to build a better future for Mongolian women scientist and girls through knowledge sharing among women scientists and young researchers, promoting the work of women scientists both domestically and internationally, and advocating for the interests of women scientists.

http://www.wstem.mn/index.php/en/introduction

The Asia Foundation is a nonprofit international development organization committed to improving lives across a dynamic and developing Asia. Informed by six decades of experience and deep local expertise, our work across the region addresses five overarching goals—strengthen governance, empower women, expand economic opportunity, increase environmental resilience, and promote international cooperation.

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