Women leading through STEM and AI in Asia

A call to action for inclusive progress in education and careers to unlock positive impact in economies and societies

Article 2
Building equality throughout the STEM skills pipeline in Asia: what can business do?

To address its social and environmental challenges, Asia needs a critical mass of students and workers with future-ready STEM and digital skills. However, girls and women are under-represented in the STEM skills pipeline in the region, from education to leadership.

Recent research by the Women's Forum has identified key blockers of gender parity in the region's STEM and AI skills and roles. But there are promising avenues for Asia-based companies to make a difference across the full education and career pipeline. They can motivate and attract girls by linking STEM skills to societal impact and retain women by creating an enabling environment.

Despite performance parity, girls and women are still underrepresented in STEM education, careers and leadership in Asia

In much of Asia, girls and women face challenges that push them out of the pipeline to STEM leadership at every stage in the journey. These challenges arise from different combinations of social, cultural, and economic factors, and a context-specific and holistic approach is needed to overcome disparities.

At school age, there is no performance gap between girls and boys, but there is a gap in interest at tertiary level. In OECD countries such as Hong Kong and Singapore, both boys and girls outperformed the 2018 Program for International Students (PISA) average score for science and mathematics. In Hong Kong, India and Sri Lanka, girls outperform or are on a par with boys in science and mathematics subjects.

However, girls tend to opt for STEM subjects less often. A survey of 16–25-year-olds in Singapore found that 60% of girls who were once interested in STEM subjects lost interest between the ages of 14-16. In India, just 34.1% of girls opted for STEM subjects in a 2014 study compared with 44.4% of boys. And in Hong Kong, a survey of high-school students identified that girls were 28.1% less likely than boys to take on at least one STEM subject.

At university level, the gender gaps in physics, ICT and engineering subjects persist and grow. In the 2021-22 school year, just 28.6% of Hong Kong engineering and technology students were women. Similarly, in Singapore and India, the proportion of women studying engineering and information technology hovers around 30%.

Why the gaps? Research suggests that environmental factors – parents, teachers, and educational materials – are more likely to reinforce negative gender stereotypes and gender bias around STEM education. Parents are a particularly significant factor: studies in India and China found that parents, household affluence, parental educational parity, and access to education drive gender gaps in STEM education, while in Indonesia, Malaysia, and Singapore, girls who pursued STEM education or jobs overwhelmingly also rated parents as their greatest influence.

Meanwhile, the proportion of women **in parts of Asia's technology workforce** can be higher than the global average: 32% of the technology workforce in Southeast Asia consists of women, while in Singapore, women comprise 41% of the tech workforce - compared to the global average of 28%. The inverse is true elsewhere in Asia: in markets such as Hong Kong and India, only 20% and 18% of the tech workforce comprises of women, respectively. And across the board, the proportion of women in the tech workforce is still below parity.

While Southeast Asia's tech companies lead the way in hiring women, research highlights that within tech organisations, they are less likely to occupy senior management and C-Suite roles. In Hong Kong too, only one in ten board chairs in tech companies are occupied by women and only 5% of tech firm managing executives are women.

On the path to leadership in STEM industries and roles, women's caregiving responsibilities often contribute to the lack of parity. In many Asian countries and cultures, women disproportionately bear the burden of caregiving for children and elders – and these caregiving responsibilities often increase at crucial junctures for promotion. For example, one study in Korea found that a staggering 53.1% of women STEM professionals discontinued their STEM careers to provide care for children. And across Southeast Asia, United Nations research finds that women spend more time on unpaid care work than men. Paid domestic help, care services and informal extended-family help are available in many Asian countries and cultures and help support women's workforce participation, but they are not equally available to all and may not necessarily address systemic biases in hiring or promotion.

What can companies do to close the gap?

So how might the private sector help create an enabling environment for girls and women in STEM?

In September 2023, the Women's Forum and Standard Chartered Bank hosted a virtual roundtable with senior leaders across industries, aimed at exploring the state of play for Women, STEM and AI in Asia and identifying related calls to action. Participants shared their professional and personal experiences, and highlighted pathways for companies in Asia to unlock the potential for truly inclusive progress through technology.

School age: engage gatekeepers, invest in education, and motivate through positive impact

Roundtable participants emphasised the importance of engaging gatekeepers to girls' STEM progress, such as parents and schools, to shift dominant cultural norms. To address students' and

parents' concerns, companies might also map out clear career paths for women with job responsibilities and opportunities for career advancement.

Where material access to technology and education is a challenge for girls and women, the private sector could step up, said Natasha Kwakwa, Global Head, Community Impact at Standard Chartered Bank. Solve Education founder Janine Teo called on the private sector to mobilise its resources by financing programmes that can bridge the education gap, particularly for girls in marginalised communities. She suggests that companies can also partner with NGOs to identify and hire women in STEM-related roles.

Finally, research also finds that girls make educational choices based on the opportunity to make a meaningful difference but are not informed well enough that STEM electives and careers pose just such opportunities. Communicating the link between STEM, digital skills and positive impact in Asia and amplifying positive stories could help close the gender gap, creating a multiplier effect in economies and societies. For example, a recent Singapore study underlined the opportunity to close gender gaps by building awareness of solutions like agri-tech and renewable energy to show girls that STEM careers are high-growth and future-proof.

Recruitment, retention and promotion in STEM careers: create an enabling environment

The motivational power of impact through STEM also applies to women in their career journeys. Women's Forum research conducted in partnership with Boston Consulting Group found that a disproportionate 77% of women in STEM in G20 countries (including India, China and Japan) were motivated to participate in upskilling or reskilling opportunities by the prospect of using these skills towards real-life applications, while 72% were strongly motivated by the ability to use STEM skills to make a meaningful difference.

In recruiting, best practices to remove bias from the process include blind recruitment, in which hiring managers are able to see applicants' skills and experience but not their gender. They can also ensure interview panels are diverse. Removing bias from job descriptions and making them clear also helps. Professor Cheryl Praeger, Emeritus Professor of Mathematics at the University of Western Australia, points out that clear job descriptions, selection criteria and expectations are helpful for candidates: "Being flexible and clear about how you appraise success and how you measure it can support women in STEM careers."

The other side of the coin in recruiting is setting targets for women's recruitment, retention and promotion. For example, Standard Chartered has set an explicit mission to achieve at least 35% representation of women on its boards and in its C-suites globally by 2025. Companies should also develop performance indicators and measure progress on many of these areas. Standard Chartered has adopted a data-driven approach, publishing statistics on their gender metrics, as well as a Fair Pay report.

Companies can take further steps to create an enabling environment for women in the STEM workforce, such as by putting in place clear anti-discrimination policies and training; offering women

structured mentoring and career support; and building networks of senior women who serve as role models and inspiration.

Brigit Simler, Global Head of Employee Advocacy at Standard Chartered, shared the bank's success story. While women make up 54% of the Bank's global management, just 12.6% of its technology leadership team was comprised of women in 2020. Standard Chartered then launched 'Ascend', a transformative programme designed to support women and build a strong pipeline of women in middle management to senior roles in the jobs of tomorrow. The programme design included structured learning, mentorship, coaching and experiential interventions. In the last three years, the share of women in the technology leadership team went from 12.6% to 20% at the end of 2022.

Beyond the organisation: private-sector support for suppliers and entrepreneurs

With the societal impact of STEM as a guiding principle, private-sector companies might also opt to support women entrepreneurs and women-led businesses making an impact through STEM.

For example, Standard Chartered has a range of programmes that support women's entrepreneurship, from financial technology (fintech) startups led by women to programmes for women-led suppliers.

In India and Malaysia, the SC WIN programme is designed to support clients who are also women entrepreneurs by offering them tailored financial solutions and benefits, business skills training, access to networks, and mentorship support. SC WIN is also available to customers in Singapore, Hong Kong and Kenya; by the end of 2023, it had lent some US$100M to women-owned small and medium enterprises globally. The bank also aims to ensure that 15% of its global spend is with diverse suppliers, including women-led businesses, often with an eye to positive social and environmental impact, such as increasing agricultural yields for women-led growers in Indonesia through sustainable practices, said Natasha Kwakwa, Standard Chartered's Global Head, Community Impact. In 2022, she added, some 70 per cent of its spending on diverse suppliers was in Asia - $130 million USD out of a global $184 million USD.

Finally, alongside its commitment to spend with diverse suppliers, the bank also supports diverse suppliers through its global 'Education-for entrepreneurs' programme which has reached more than 105,000 micro and small businesses – 50,000 more than the 2023 target. Sixty-four per cent of these are owned by women.

The Women's Forum and our partners believe that companies in Asia can help tackle social and environmental challenges, address their business needs, and make a real difference for girls and women in their organisations and communities – all by adopting best practices and drawing a clear link between STEM skills and positive impact. These measures can deliver the talent and skills that Asia needs for a digitally-enabled, just and sustainable future.

This article draws on desk research and interviews recently conducted by the Women's Forum alongside its Asia Strategic Lead, Standard Chartered Bank, as well as insights from a virtual

roundtable held in September 2023 with senior leaders aimed at generating the state of play for Women, STEM and AI in Asia and identifying related calls to action.