

KEY FINDINGS OF THE FOCUS GROUP DISCUSSION

REPORT

August 2024

“Motivations and challenges facing women
STEM graduates in Saudi Arabia in entering
the tech sector”

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EXECUTIVE SUMMARY

The partnership between UN Women Regional Office for the Arab States (ROAS) and Nokia aims (a) to strengthen the capacities of vulnerable women by enhancing their employability, entrepreneurship, and agency in the online sphere; and (b) to foster women's participation and leadership in the tech sector. This collaboration, covering eight countries including Saudi Arabia, represents a new model of public-private partnership to advance gender equality and women's empowerment. Nokia contributes its global resources and expertise, while UN Women brings technical knowledge on gender equality and women's empowerment (GEWE) and experience in local contexts.

In Saudi Arabia, government figures indicate that more women than men are graduating from university with STEM qualifications¹. Notwithstanding this achievement for women's education, there remain opportunities to leverage these results and grow women's employment in the tech sector. The partnership aims to address these opportunities through collaboration on initiatives such as the Nokia internship programme, which builds the capacities of women STEM students and graduates to improve their employability in the tech sector. This initiative aligns with both the global Agenda 2030 for Sustainable Development and the Kingdom of Saudi Arabia's National Transformation Programme (NTP), which emphasizes women's economic empowerment.

A Focus Group Discussion (FGD) was conducted on 11 July 2024, at Nokia's Riyadh office, involving 22 female participants from the internship programme. The internship programme is an eight-week initiative designed and implemented by Nokia in Saudi Arabia. The FGD explored the motivations of Saudi women STEM students and graduates to work in the tech sector and identified challenges they face. Key motivations expressed by the participants included the accessibility of initiatives aimed at supporting women in STEM; the support of family members and schools; the visibility of role models, particularly Saudi women role models; and a personal interest in technology and innovation. However, participants also highlighted significant challenges, such as limited access to information, public misconceptions about mixed-gender work environments, and inadequate workplace accommodations.

The findings from the FGD suggest the need for a multi-faceted approach to address these challenges. Key recommendations include:

For Government Decision-Makers: Enhance data collection on women's employment in STEM, produce evidence-based reports on progress, and implement policies to foster inclusive workplaces and women-led tech startups.

For the Private Sector: Conduct further FGDs, review gender policies, sign the [Women's Empowerment Principles](#), and increase investment in women-led companies.

¹ General Authority for Statistics, Saudi Arabia. *Woman International Day 2020*. 2020. Available at: https://www.stats.gov.sa/sites/default/files/woman_international_day_2020EN.pdf

For Universities and Schools: Promote awareness of STEM opportunities, enhance coordination with secondary schools, and leverage alumni networks to highlight success stories.

Implementation of these recommendations would be crucial to encourage more women to enter and thrive in STEM fields, thereby promoting women’s economic empowerment and contributing to sustainable national development. In order to further expand the knowledge on how to enhance women’s participation in STEM, it would be useful to complement this FGD with discussions from other industry members.

1. Introduction

UN Women Regional Office for the Arab States (ROAS) and Nokia are leveraging digital solutions and private sector networks to (a) strengthen the capacities of vulnerable women to enhance their employability, entrepreneurship and agency in the online sphere; and (b) foster women’s participation and leadership in the tech sector. Phase two of this global partnership (2024), led by ROAS, spans eight countries: Jordan, Tunisia, Saudi Arabia, Türkiye, Argentina, South Africa, India and the Philippines.

The partnership introduces a new model of collaboration to advance gender equality and women’s empowerment through the private sector; one where Nokia is a sustainable development actor, contributing its global human resources and specialist expertise, and leverages its network to mobilise the participation of other industry leaders to scale-up impact. UN Women contributes its technical expertise on gender equality and women’s empowerment (GEWE), detailed knowledge of local contexts, and experience in coordination for development. In Saudi Arabia, since 2022, ROAS supports Nokia’s internship programme to build the capacities of women STEM students and graduates, to foster their employability in the tech sector.

The global Agenda 2030 for Sustainable Development recognize that “information and communications technology and global interconnectedness has great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies”. Under Sustainable Development Goal 5 (“achieve gender equality and empower all women and girls”), the international community has committed to enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women. The Kingdom of Saudi Arabia (KSA) National Transformation Programme (NTP) aims to improve women’s labour market participation and in alignment with the NTP, the UN Sustainable Development Cooperation Framework in KSA has identified Women’s Economic Empowerment (WEE) as a key area for the UN’s strategic development technical assistance to KSA stakeholders to support achievement of Agenda 2030.

In Saudi Arabia, government figures indicate that more women than men are graduating from university with STEM qualifications². Notwithstanding this achievement for women’s education, there remain opportunities to leverage these results and grow women’s employment in the tech

² General Authority for Statistics, Saudi Arabia. *Woman International Day 2020*. 2020. Available at: https://www.stats.gov.sa/sites/default/files/woman_international_day_2020EN.pdf

sector. The partnership between UN Women ROAS and Nokia aims to address these opportunities in the technology sector by developing and piloting an evidence-based model to increase women's recruitment, retention and promotion in Nokia KSA.

The present Focus Group Discussion (FGD) was conducted on 11 July 2024 at the Riyadh offices of Nokia. The Focus Group was composed of 22 women participants in the internship programme. It was conducted with the purpose of eliciting information and insights into the motivations for the participants to enter the tech sector in Saudi Arabia, and equally to understand better to challenges that they face in realizing this goal. The findings of the FGD will inform UN Women policy advisory services and programming in Saudi Arabia and feed into the regional programme "Surging women's employment in the Arab States", wherein UN Women has identified the STEM economy as a key pillar for job creation.

2. Methodology

Twenty-two women participants in the Nokia internship programme joined the FGD. All participants were in the final year of their Bachelor's degree in a STEM area, except for two in their third year and one who had already graduated. They came from five universities: Princess Nourah bint Abdulrahman University, King Saud University, Mustaqbal University, Shaqra University, and Imam Abdulrahman Bin Faisal University. All participants were from Riyadh except for six who came from Al Qassim and Shaqra and East region.

All participants in the Nokia internship programme were invited to the FGD, which was held in a meeting room at the Nokia Saudi Arabia office in Riyadh. Two staff members from UN Women (Regional Coordination Specialist and Data Programme Analyst) facilitated the session.

The FGD was conducted on 11 July 2024, from 11:30am to 11:50am and from 12:45pm to 13:45pm. Prior to the FGD session, UN Women introduced the objectives of the FGD with a presentation outlining UN Women's mandate in the Arab States region, and the linkages between gender equality and women's empowerment and the tech sector. The moderators also ran a series of short activities to break the ice and let them get to know more about the participants. Together, these preliminary sessions aimed to build trust with the participants and encourage a sense of confidence and transparency around the FGD itself.

Moderators: Josephine Moss, Regional Coordination Specialist & Sawami Hayashi, Data Programme Analyst

Note-taker: Josephine Moss, Regional Coordination Specialist

All three authors contributed to the design of the content and methodology of the FGD.

• Discussion

The FGD comprised two types of discussions: a plenary session of 15 minutes with all participants and small-group discussions for 40 minutes. Participants were divided into four groups for small-

group discussions, where two groups discussed motivations and the other two discussed challenges and recommendations. After small-group discussion, each group shared the results of their discussion with the plenary.

Starting questions for both plenary and small-group discussions included:

Plenary Session

- Why did you apply for the Nokia internship programme?
- Why did you decide to pursue a degree in STEM?
- What type of support is available to women to enable them to pursue a career in the tech sector?
- How important do you think it is to have more women working and leading in the tech sector?

Small Group Discussions

For groups one and two:

- Overall question: What motivates you to work in the tech sector?
- Guiding questions:
 - ✓ What role models did you have?
 - ✓ Who supported you to pursue a STEM degree and career?
 - ✓ What opportunities do you see in the tech field?
 - ✓ What are your career ambitions?
 - ✓ How do you believe your presence in the tech sector can contribute to gender equality and diversity in the workplace?
 - ✓ Do you think there are unique opportunities for women in tech?
 - ✓ What influence do government campaigns and initiatives have?

For groups three and four:

- Overall question: What challenges or barriers do you think exist for women entering the tech sector? What recommendations would you make to address these challenges?
- Guiding questions:
 - ✓ What internal challenges (e.g., awareness, self-confidence) do women face?
 - ✓ What external challenges (e.g., family, societal opinions) do women face?
 - ✓ What factors related to geography and access to information/opportunities?

3. Findings

Based on the discussions during the FGD, findings are classified into three main themes. The first theme is the motivation for Saudi women STEM graduates to work in the tech sector. The second theme addresses the existing challenges and barriers they face. The final theme provides recommendations to address these challenges.

Theme 1: What motivates Saudi women STEM graduates to work in the tech sector?

Participants frequently mentioned the availability of initiatives supporting women aspiring to work in STEM area as a motivating factor. Besides the Nokia internship programme targeting women STEM graduates, participants shared several other initiatives supporting, such as:

- Global Engineering Girls: An international initiative aiming to inspire young women engineers by providing education, mentorship, and career opportunities in Turkey, North Macedonia, Kosovo, and Saudi Arabia. Their support in Saudi Arabia started in 2024, targeting 20 women.
- Scholarship in Riyadh: Started in 2021 to support girls in coding and app development in collaboration with Princess Nourah University.
- Invention competition in Al Qassim: There has been a competition for girls to showcase their innovations and academic excellence for the past three years.
- Institute of Electrical and Electronics Engineers (IEEE): A large international community for women in engineering.
- Tamheer Program: A job training program under the Human Resources Development Fund that prioritizes recruiting women for internship opportunities, providing financial aid for up to six months.

Support from family was also mentioned repeatedly as a motivating factor. Some participants shared that having a supportive family, especially when families are informed and encouraging about STEM careers, was crucial. Quotes from participants include:

- *“My biggest support is my father. He made me believe there is no difference between men and women.”*
- *“My family supports me because I am the first woman who will be an engineer in my family, and that’s impressive for them.”*
- *“My mom always told me – don’t be afraid of anything, I will support you in anything for your education.”*

Having a role model also encouraged participants to pursue their careers in STEM. For instance, Ms. Mishaal Ashemimry, a Saudi-American astronaut, was mentioned by multiple participants as a role model. A participant said:

- *“The first person who takes the first step can really encourage others to enter an industry.”*

Some participants shared that they have been interested in STEM area since their childhood. Their interest in innovation, creativity, and technology led them to apply for related degree. Some mentioned that the fact that STEM is a male-dominant industry even motivated them to pursue getting such degree as them being in such an industry could empower other women. The financial stability of STEM jobs was also mentioned as a motivating factor.

Regarding this specific Nokia internship, their universities also played a crucial role. All the participants shared that their academic programmes require them to work for a credit by undertaking an internship. Participants from Princess Nourah bint Abdulrahman University mentioned that their university has career support for students and alumni, sharing information about internships and career opportunities. Meanwhile, a participant from Mustaqbal University noted that her university only introduced the engineering major in 2018. As a relatively new programme, it does not yet offer much career support, hence she had to research opportunities on her own.

Theme 2: What challenges or barriers exist for Saudi women entering the tech sector?

A significant barrier identified is the lack of information, which contributes to the underrepresentation of women in STEM. While some FGD participants have communities or support systems, such as their universities, to exchange knowledge about the industry, accessible information on the STEM industry among women in Saudi Arabia still remains limited. One participant from a co-ed university shared that she is among the first women allowed to study STEM at her university and struggled to find information on job searches or internship opportunities, requiring extensive self-research to access the Nokia internship. One participant recounted that when she presented her experience in STEM to high school students, they were surprised to learn that women could register for engineering degrees and were unaware of the degree requirements. This limited availability of information on women in STEM have been a challenge for women who aspire or could potentially aspire to aim to enter STEM industry.

This lack of information available on this career option also leads to misconceptions about mixed-gender working environments, which further deter women from pursuing STEM degrees. Some participants shared that rumors of mixed or male-dominated work environments being unsafe for women persist due to social media, despite a lack of concrete evidence. This misconception affects not only the women themselves but also their families. As a result of such misinformation, some families discourage their daughters from studying STEM.

Some participants shared the concerns about the work style in STEM area. Concerns about working in remote areas, perceived as unsafe for women, were raised. Some engineering roles require work in remote locations, including deserts, and participants shared their impression that companies may be reluctant to send women to these sites. Additionally, the perception that STEM roles involve significant physical labor deters some women from pursuing such careers. The lack of certain accommodation for women in the workplace, such as separate prayer rooms and culturally appropriate safety clothing, was also highlighted.

Another challenge is that women in STEM could be one of the few women in a predominantly male workplace. A participant expressed that it would be more comfortable for women if they could work together rather than being the only woman among male colleagues. Participants also mentioned cultural communication barriers between men and women, a lack of confidence among women, long working hours, stereotypes about the STEM industry, and the financial burden of education costs as additional challenges.

The FGD also revealed a disparity between Riyadh and other regions regarding information and access to STEM opportunities. One participant from outside Riyadh noted that most scholarships and initiatives targeting women are concentrated in Riyadh. This geographic disparity limits access to opportunities for women in other regions.

Theme 3: What do Saudi women STEM graduates recommend to address these challenges?

Participants shared that more initiatives for information sharing are needed. Some suggested that companies in STEM could provide evidence that their mixed-gender environments are not dangerous for women, to enable more families to support women's careers in STEM. There was consensus that the difference between supportive and unsupportive families is their education and awareness. By actively raising awareness on the actual experiences of women working in a mixed-gender environment, more women and their families would feel positive about such workplaces.

Additionally, they recommended that women in the STEM industry should visit schools to share their experiences with young students. Organizing school field trips to STEM-related workplaces was also recommended. One participant mentioned that her cousin decided to study STEM after a female engineer visited her school. Establishing more engineering clubs for women was also recommended to encourage active information sharing and networking.

Securing an inclusive work environment was emphasized by multiple participants. This includes providing separate prayer rooms for women and offering necessary accommodations, such as daycare services and flexible working arrangements, for those who need to take care of their families. Several participants expressed appreciation for the accommodations made by Nokia in this regard. Participants also recommended that the selection process should be based on qualifications, not the sex of the applicants, highlighting their determination to be seen and treated as equals in the workplace.

Interpretation of Findings

In this FGD, female students participating in the Nokia internship discussed what motivates Saudi Arabian women to work in the STEM industry, the barriers they may face, and recommendations to address these barriers. The discussion covered various aspects of the current situation surrounding Saudi Arabian women, including the women themselves, their families, schools, and companies. A repeated topic during the discussion was the significant lack of publicly available information about women working in STEM, their positive experiences and the opportunities offered by a STEM career. This was reflected in the presence of female students who had been

unaware they could pursue higher education in STEM and in the voices of FGD participants from coeducational universities who struggled to find information about the Nokia internship.

This lack of information affects not only female students themselves but also their families and companies. Misinformation online suggests that it is dangerous for men and women to work together, which discourages some families from supporting women to pursue a STEM career. Additionally, some companies in this industry (as well as others) may lack the necessary information on how to attract and accommodate more women employees.

To address this information-sharing deficit, it is effective for women already active in STEM fields to share information with young women proactively. Companies should also provide opportunities for female students to learn about their work environments to counter existing misinformation. Better information sharing is crucial not only for women but also for universities, companies, and various other actors.

As efforts to promote the entry of Saudi Arabian women into STEM fields progress, it is essential to establish work environments where women can continue to pursue their career. The FGD highlighted the need for more women in male-dominated environments, separate prayer rooms, and work policies that facilitate balancing work with household chores and childcare. Without these considerations, even if women enter the industry, their retention rates may remain low. Research by the Boston Consulting Group (2017) indicates that companies with higher levels of diversity get more revenue from innovations, such as new products and services³.

The gap between Riyadh and other regions was also frequently discussed. One motivation for women to pursue STEM fields is existing opportunities such as scholarships and internships targeted at women, but currently, these opportunities are mainly limited to Riyadh. This issue is linked to the educational opportunity gap between Riyadh and other regions. Efforts are needed to ensure that more women can access educational and employment opportunities and information in STEM fields, ultimately leading to attracting the best talent.

The strengths of this focus group discussion lie in hearing directly from female students who are either currently pursuing or have already obtained STEM degrees. By speaking with individuals active in the STEM industry in Saudi Arabia, moderators could specifically understand their motivations and challenges, allowing participants to share their experiences concretely. Additionally, the group discussion format allowed for follow-up remarks from many participants, leading to a deeper exploration of the topics.

This FGD necessarily represented a small portion of women in the STEM industry in Saudi Arabia. Having more FGDs such as this one, involving women in other companies and at other stages of their careers, would complement the findings and allow a more comprehensive analysis of the themes under consideration. Additionally, since these participants are already involved in STEM education, it is possible that participants could not discuss deeply the barriers that they did not experience. Further, many participants were based in Riyadh, hence issues related to regional disparities may not have been fully clarified. Finally, the group discussion format may not have

³ <https://www.bcg.com/publications/2017/people-organization-leadership-talent-innovation-through-diversity-mix-that-matters>

allowed for the discussion of sensitive issues that could be better addressed in a one-on-one setting. To create STEM work environments where more women can fulfill their potential, it is desirable to have more opportunities such as this FGD to hear a broader range of voices from concerned parties.

4. Conclusions

The responses of the 22 participants during the FGD, reflected the significant social and economic changes that have taken place in Saudi Arabia in recent years. This group of women, with the resources and support networks to choose their own educational path, were confident in asserting their right to participate in the tech workforce on the basis on equality with men. The participants highlighted a mix of external and internal factors that influenced their decision to pursue a STEM degree and career in tech. Importantly, several of these factors could be addressed through multi-partnership initiatives by universities, industry and government with a view to increasing women's participation in STEM. Universities and national policies and initiatives are encouraging women, and their families, to consider a career in STEM fields. Notwithstanding this progress, social norms around women and men working in the same office appear to persist. The nature of social normative influence predicates that it would be difficult to quantify the cost to the Saudi tech industry and national economy of the indirect exclusion of talented women due to such stigma.

The findings from this FGD serve to strengthen the initiatives undertaken under the partnership between UN Women ROAS and Nokia to support women's economic empowerment. By continuing to explore and address the unique needs and challenges faced by women in STEM, there is potential to significantly increase women's participation in the STEM sector in Saudi Arabia. This will not only contribute to empowering women in Saudi Arabia but also foster innovation and inclusive economic growth, aligning with the Agenda 2030 for Sustainable Development. The ongoing collaboration between UN Women ROAS and Nokia serves as a model of public-private partnership contributing to advancing progress toward achieving these critical goals.

5. Recommendations

To Government Decision-Makers:

- Enhance the production of sex-disaggregated data to track women's employment, retention and promotion across industries aligned with national development objectives, such as technology, to enhance analysis and understanding of trends, gaps and opportunities to increase women's employment in those fields.
- Produce an evidence-based report on national progress in the achievement of Sustainable Development Goal target 5.b: "Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women" in furtherance of national sustainable development priorities.
- Consider policy initiatives to foster more inclusive workplaces for women in tech.
- Consider policy initiatives to encourage more women-led or majority women-owned tech start-ups.

- Invest in employment initiatives that incentivize the recruitment of women in the tech sector, including in emerging priority sectors such as e-sports and the digital green economy.
- Implement a national programme to promote positive social norms around women's participation in paid employment, particularly in STEM fields, noting that social norms are an accelerator for women's labour force participation.

To the Private Sector:

- Partner with UN Women to conduct further FGDs with diverse groups of women at various stages of their tech career.
- Conduct a gender analysis of existing human resources policies, office space, and procedures to identify strengths and areas for further action to enhance workspaces that are inclusive of women.
- Apply reasonable accommodations to develop inclusive work facilities and implement flexible working policies to support women's participation, retention, and advancement in the STEM sector.
- Sign the [Women's Empowerment Principles \(WEPs\)](#) to showcase the company's commitment to advance gender equality and women's empowerment in the workplace, marketplace and community, and access guidance and toolkits to foster business practices that empower women.
- Increase investment in supply-chain companies that are led and / or majority-owned by women.
- Highlight progress, lessons learned and good practices on women's participation and leadership in corporate Environment Social and Governance reporting.
- Leverage media, including social media and the Saudi media landscape, to increase information-sharing about STEM workplaces and women's careers in tech, to counter negative misconceptions.
- Convene a sub-regional sectoral knowledge-exchange workshop on lessons learned and good practices in attracting, retaining and promoting women in tech.
- Enhance career opportunities supporting women in STEM, such as targeted internship opportunities informed by the Nokia model and career coaching.

To Universities and Schools:

- Promote awareness of women in STEM among students, including by organizing educational visits to STEM workplaces and providing opportunities to hear from women in STEM.
- Increase information-sharing and coordination between universities and secondary schools to encourage students to apply to tertiary STEM courses.
- Expand information-sharing about opportunities in STEM for women, such as internship opportunities and scholarships, so that students can easily access this information.
- Leverage alumni networks to share success stories and role models for women in tech.
- Co-educational schools to ensure reasonable accommodations for women students in STEM faculties.

6. Annexes

- I. [UN Women session presentation](#)
- II. [Photos](#)