Challenges and Opportunities in Training and Mentoring Returning Women

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Abstract— **Women who return to careers after a career break face unique challenges and untapped opportunities in the industry. Career breaks, often due to family responsibilities, childcare, eldercare, or personal reasons, create significant barriers to re-entry into the workforce. However, with increasing awareness, diversity and inclusion initiatives, and government policies, industries and academia are beginning to create pathways for women engineers to return. The engineering sector must evolve to accommodate returning women, leveraging their experience and skills. With structured mentorship, upskilling, returnship programs, and inclusive hiring policies, returning women can rebuild their careers and contribute significantly to STEM innovation, research, and leadership. This paper analyses the education initiatives to reskill and upskill the returning women by two international training programs - Returning Mothers Conference of IEEE and SAR100 program of WePOWER network of the World Bank and consolidates the outcomes which can evolve to benefit both industries and women.**

I. Introduction

The underrepresentation of women in engineering academia and industry is a long-standing challenge, further exacerbated when women take career breaks due to caregiving responsibilities, relocation, or personal reasons. Despite their qualifications and prior experience, returning to academia presents multiple barriers, including outdated technical skills, biases in hiring, lack of mentorship, and difficulties in securing research funding. The engineering industry has long struggled with gender diversity, with women often facing structural and cultural barriers to entry, retention, and career progression. Many women find themselves disconnected from industry advancements, struggling with skill gaps, and facing biases in hiring and career growth upon re-entering the workforce. These challenges often lead to career stagnation, underemployment, or complete disengagement from the profession.

However, recent global and national efforts to promote gender diversity in STEM have led to the emergence of returnship programs, re-entry fellowships, flexible work policies, and mentorship initiatives, offering new pathways for women to rejoin and excel in academia.

Initiatives by organizations such as Academic Regulatory Bodies, International Organisations such as IEEE Women in Engineering (WIE), WePOWER network of the World Bank and research funding bodies are gradually addressing systemic challenges by providing reskilling opportunities, research grants, and leadership development programs for women returning to engineering education. Similarly, with increasing recognition of the importance of diversity, the industry is gradually adapting to support returning women through returnship programs, flexible work arrangements, mentorship initiatives, and upskilling opportunities. Leading organizations, including Tata, IBM, General Electric, Amazon and Cisco, have launched structured return-to-work programs to reintegrate women into engineering roles.

The challenges faced by the Returning Women in Engineering can be segregated as passive challenges and active challenges:

A. Passive Challenges (Systemic Barriers)

• Career Gaps Perceived Negatively: Many employers see career breaks as a loss of technical expertise and relevance.

• Limited Returnship Programs: Few structured returnship programs exist in engineering domains compared to IT or finance.

• Lack of Networking & Mentorship: Fewer industry connections or support networks make it harder to find opportunities.

• Bias in Hiring & Promotions: Women returning after a break may face unconscious bias regarding commitment, prioritisation and productivity.

• Slow Career Progression: A career break can result in lower designations, salary stagnation, or limited leadership opportunities.

• Industry Evolution & Technological Gaps: Engineering fields like AI, IoT, and Robotics evolve rapidly, making skill gaps a significant barrier.

• Lack of support Infrastructure and Policies: Offices, and especially field locations, lack appropriate infrastructure and policies to support returning women

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B. *Active Challenges (Personal & Social Factors)*

- Lack of confidence & Imposter Syndrome: Many returning women feel undervalued and underprepared to compete in the workforce.
- Work-Life Balance Struggles: Managing family, children, and professional commitments simultaneously is a significant concern.
- Relocation Constraints: Women often have geographical constraints due to family responsibilities, limiting job flexibility.

The above challenges have been known to the corporates and the women for a long time but to address them all together needs active participation from both the beneficiaries. Though the women are looking for jobs, they take little or no effort to reequip themselves to match the expectations of the industry. Similarly, the industry tries to incorporate the returnship programs but the effort is sporadic and not able to address the emotional and physical challenges the women go through. Hence there is a requirement to have a holistic view of the expectations from both sides and address the feasibility concerns which the following two programs do.

II. Literature Survey

Martinez and Lopez (2021) focus on mentoring initiatives tailored for women in STEM fields. Their findings highlight the positive impact of female mentorship on confidence-building, career progression, and breaking gender stereotypes in academia. This paper focuses on a mentoring program designed to support women in engineering through female-to-female mentorship, fostering empowerment and professional growth.

Farzana Rahman et al.,(2022) organised a virtual conference during the Covid- 19 pandemic to understand the challenges faced by women with respect to having educational breaks and career breaks and reported that the attendees were very satisfied with the knowledge and motivation provided by the conference to pursue education and career. Karen Ferrez Frisch, Sandra Costa and Florinda Matos (2024) have identified the push and pull factors affecting the ability of the women to return to the career after a break. A comprehensive study on the internally provided returnship programs and externally provided Return to work programs and their impact on the women has been carried out to identify the push factors such as corporate support, life and financial stability and growth and pull factors such as confidence, work life balance concerns, discrimination and bias. Amy B. Valente (2019) presented a thesis on the employment transition of returnees and their re-entry experiences. The data collected examines their experiences and provides the recommendations for the women such as planning for the break and reentry, utilising firms who provide services to re-enter the workforce and peer mentorship. The recommendations to the employers include creating networks to keep in touch with the women in break and offer training, part time jobs or remote opportunities wherever possible. Greer (2013) identifies that confidence and self -esteem are the most important requirement when a woman re-enters the work force and without these two, the sustainability of the career is impossible.

Ashoka University's Genpact Centre for Women's Leadership's (GCWL) 'Predicament of Returning Mothers' (2018) focused on three cohorts of women from the private sector, social and development sector, and media and communications - currently pregnant women not planning to return/uncertain, women who have dropped out completely post their pregnancy, and women who have returned to their work post their maternity leave but are facing challenges. The study revealed several challenges faced by pregnant women and returning mothers and recommends six action areas for smooth transition back into work life - guilt management, negotiation skills, career planning, re-skilling, awareness and information, and (time, home and child) management.

Gunatilaka (2019) explores the challenges faced by women engineers returning to the workforce and the effectiveness of reentry programs. The study highlights structural barriers such as skill obsolescence and workplace biases while evaluating initiatives that facilitate smoother transitions. Recommendations include mentorship programs and tailored upskilling opportunities to reintegrate women into engineering roles effectively.

Blanco (2019) examines diversity-focused STEM programs designed to support women engineers. The paper discusses organizational strategies that enhance gender inclusivity, such as scholarship initiatives, flexible work arrangements, and leadership development. It emphasizes the role of industry collaboration in sustaining these initiatives and improving retention rates for women in engineering.

Johnson et al. (2020) analyze various reentry programs designed specifically for women in engineering. The study categorizes these programs based on their approach, including skill refreshment courses, networking platforms, and corporate internship models. The findings suggest that structured reentry pathways significantly increase employment rates and job satisfaction among returning women engineers.

Thomas and Miller (2020) investigate the role of returnship programs in bridging the employment gap for women in STEM. The study assesses the effectiveness of industry-sponsored returnships in addressing career interruptions and facilitating skill renewal. Key insights include the importance of flexible program structures and employer support in ensuring successful workforce reintegration.

Pradeep and Krishnan (2021) propose a structured upskilling model aimed at assisting women engineers in career reentry. The model integrates technical training, industry mentorship, and networking opportunities. Empirical results indicate that a well-rounded approach enhances confidence and technical competence, thereby increasing employability.

Patel et al. (2020) discuss gender bias in engineering and its impact on women's career trajectories. The paper reviews

programs that combat implicit biases, promote workplace equity, and support career reentry for women engineers. Recommendations include institutional policy reforms and awareness initiatives to foster inclusive engineering environments.

Harris and Green (2020) explore the effects of career breaks on women engineers, identifying key challenges such as skill depreciation and hiring biases. The paper evaluates both individual and organizational strategies that facilitate smooth transitions, including reskilling programs and employer-sponsored returnships.

King et al. (2020) present a global perspective on initiatives aimed at increasing female participation in engineering careers. The study compares regional efforts, highlighting best practices such as government-backed return-to-work programs, corporate diversity policies, and mentorship networks.

Smith and Martin (2019) conduct a case study on returnship programs for women engineers, analyzing their structure and impact. The findings underscore the necessity of providing hands-on industry experience, confidence-building activities, and peer support systems to ensure successful reintegration.

Mitchell (2021) presents another case study on returnship programs, emphasizing employer perspectives. The study reveals that well-designed returnship initiatives not only benefit returning engineers but also contribute to organizational diversity and innovation.

Garcia et al. (2020) examine workplace diversity and inclusion initiatives that support women engineers. The paper identifies best practices such as targeted hiring programs, mentorship pairings, and employee resource groups that foster long-term career growth for women in engineering.

Brown and Yates (2021) explore mentorship and sponsorship as key strategies for career reentry. The study highlights best practices, including structured guidance programs, peer support networks, and leadership training, to help women engineers navigate career transitions successfully.

Thomas et al. (2020) assess the role of reskilling initiatives in facilitating women's return to engineering careers. The paper presents evidence that targeted reskilling programs, particularly those integrating hands-on project work, significantly improve employment prospects for returnees.

Greenfield (2019) discusses pathways for women engineers to achieve long-term career success after reentering the workforce. The paper suggests that continuous learning opportunities, supportive workplace cultures, and professional networking play crucial roles in sustaining career growth.

Robles and Wu (2020) analyze the WePOWER network and other career reentry programs for women engineers. The study highlights the effectiveness of industry collaboration, policy support, and international networking in creating sustainable pathways for career reentry and advancement in engineering.

The experimental workshops and conferences along with the data collection on the challenges the women face when they re-enter have provided a lot of insights but there is one more area to be studied if we really wish to have concrete evidences of the efforts by the employers to understand the returnees and the returnees to understand the current re-entry landscape. Hence the two programs by the IEEE and WePOWER are analysed in terms of the outcomes of the trainings and the re-entry

III. Direction of the paper

For sustainable re-entry of the women in technology into the work stream, the following points were identified as the feasibility requirement:

• Awareness & Advocacy: Promote stories of successful returning women engineers to inspire and normalize career breaks.

• Reskilling & Certification Support: Provide access to STEM training, AI, IoT, Industry 4.0, and cloud computing courses, especially in emerging technologies that put women ahead of the curve and/or allow women to better balance work and life.

• Strengthening Returnship Programs: There should be structured return-to-work training and mentoring programs and leadership development programs to ease workforce integration.

• Policy Reforms for Career Breaks and Return: Recommend career break and return friendly policies, including sabbaticals, upskilling opportunities, flexible work hours and support infrastructure.

• Support Networks: Networking, mentoring, and career guidance to encourage mid-career growth opportunities and leadership pipelines for returning women.

The paper analyses the above 5 areas where the two programs- IEEE Returning Mothers Conference and SAR100 of WePOWER shown progress in bridging the gap. The impacts of both the programs are significant identifying these programs as catalysts for change in the domain of diversity and inclusion. However, the implementation of the learnings evolving out of these two programs require the cooperation and collaboration of both the women and the employers and suggestions to bridge the gap and remove the barriers are provided in the conclusion.

IV. IEEE Returning Mothers Conference and associated trainings

Re-entering the workforce is not without its hurdles. Returning to work after time away can be intimidating. It might feel like technology has moved faster, that industries have transformed, and that there's a rush to "catch up." IEEE Returning Mothers Conference was started in 2019 with the key objectives such as raising awareness on the challenges and biases that returning women engineers face, providing mentorship & networking opportunities through industry professionals, academia, and

research mentors, upskilling and reskilling the women on break by offering workshops on emerging technologies, career development, and leadership training, showcasing returnship programs, industry-led initiatives that facilitate smooth re-entry into engineering roles and encouraging organizations and policymakers to introduce gender-inclusive policies for returning professionals. This conference specifically emphasizes the challenges that returning mothers face, such as bias, career stagnation, and lack of adequate support. By bringing attention to these issues, the conference promotes practices that help mothers return to work with equal opportunities for career growth. It also provides a platform for sharing strategies and best practices to support mothers' mental health. Addressing postpartum mental health challenges, they advocate for support networks within organizations, understanding that mental wellbeing is crucial to mothers' successful reintegration.

V. WePOWER SAR 100 Training

The WePOWER (Women in Power Sector Network) initiative, launched by the World Bank, is a regional platform aimed at increasing the participation of women in the industry and academia, pertaining to the energy sector, particularly in South Asia. With energy being a critical driver of economic growth, gender diversity in this sector is essential to enhance innovation, productivity, and decision-making. However, women remain significantly underrepresented in technical and leadership roles. WePOWER seeks to bridge this gap by removing barriers, promoting gender-responsive policies, and empowering women to thrive in the energy workforce. Recognizing the severe gender disparity in the industry, WePOWER fosters collaboration between governments, utilities, academia, and private-sector organizations to strengthen the STEM pipeline, create inclusive work environments, mentorship opportunities, and capacity-building programs for women.

WePOWER advocates a five-pillar structure to help close the employment gap for women in the South Asian energy sector, while taking into account the socio-cultural and capacity challenges. One of the pillars under the initiative is 'Career Development' under which WePOWER engages STEM institutes, industry leaders and partners to create personal and professional development opportunities, such as mentorship programs, leadership training/coaching, that are crucial for women's continued progression in their careers, especially in the more technical fields. The WePOWER SAR100, launched in 2023 is a professional training series for 100+ mid-career women engineering professionals from the South Asian Region (SAR). It is a WePOWER training series that was supported by the Australian Department of Foreign Affairs and Trade (DFAT) and Palladium International, and is imparted by the Asian Institute of Technology. The eight-month comprehensive training program is designed to equip women engineers for gender inclusive leadership, ensuring gender diversity in the energy sector while addressing the growing challenges of energy transitions in South Asia. The SAR100 trainees are nominated by the utilities and energy companies, many of them being WePOWER partners.

While the training is designed to impart advanced technical skills, it takes into account the major systemic and perception barriers that mid-career women engineers face in their workplaces, leading to stagnation in career advancement. A strong emphasis, is thus, laid on specialized networking opportunities to women engineers, and empower them for senior management roles. Besides, the training design accepts and accounts for women's social role as caregivers and offers a hybrid learning module that includes online modules, research projects, and site visits. This flexibility allows mid-careers women to maintain work-life balance

VI. Analysis

A. Awareness & Advocacy: (Social media engagement, media coverage, attendance, new partnerships formed, etc)

The conference drives awareness of unconscious biases and the stigmatization that returning mothers might face. By educating employers and employees, the conference works towards creating a culture of understanding and support, encouraging inclusive attitudes toward working mothers. Returning Mothers Conference has a strong publicity committee with a score of volunteers working towards a systematic and wide publicity through the social media and other channels. Articles, creatives and reels are posted in the social media along with interactive Q&A sessions with the audience on the various topics related to the conference theme are posted regularly. The target audience are reached out by organising Pre-Conference events such as Coffee Chats, Panel Discussions and interviews with role models and employers. This has increased the interests of the partners and the engagement of the returning women.

B. Reskilling & Certification Support: (No of trainings, participants, completion of the course, feedback, job placements)

The conference often highlights the importance of reskilling and upskilling programs tailored for mothers. Many returning mothers benefit from targeted training programs that help them reintegrate into rapidly changing workplaces and ensure they remain competitive. A number of trainings have been organised by the Returning Mothers Conference.

The WePOWER SAR100 completed the first training in 2024 with a cohort of 101 women from the energy sector in South Asia. The training for the second cohort is on-going. Consistent feedback from the trainees has been that the program has tested and proven the women's ability to balance professional growth with personal commitments.

C. Strengthening Returnship Programs (No. of companies ready to employ them, ready to provide returnship trainings, no of women increased)

As mentioned by Ramalatha Marimuthu et al., (TECIS 2024), there were three cohorts between 2021to 2023 which were a good fit for the returning women to be trained in multiple skills such as technology, communication and branding. These skills were provided by the expert trainers for a period ranging from 2 months to 4 months. More than 400 women have been trained till 2024 in various technologies.

Though nearly 80% of the women who were trained received certification, the reentry has not occurred equally. There are many reasons for this, including the failure to map the skills with the requirement and the requirement for the women to relocate and so on. Hence only 20 % of the women have reentered the workforce till now.

D. Policy Reforms for Career Breaks (No. of companies introducing women friendly environments, policy formation and deployment, new policies introduced)

The conference emphasizes the importance of family-friendly workplace policies that support the balance between career and family. This includes flexible working hours, telecommuting options, and parental leave policies that accommodate the needs of both mothers and fathers.

Besides building a gender inclusive leadership, it is expected that the gender inclusive nature of the training will percolate to the organisations that the women trainees are employed by, through organisational engagement and informal networking. As the WePOWER SAR100 participants are nominated from WePOWER partners, the reports from partners capture policy reforms within organisations for facilitating returnship. While attributing this entirely to WePOWER SAR100, the program witnesses strong champions emerging from within the cohort.

The BSES Group of utilities in India have started to actively encourage applications from women returning to the workforce following career breaks for childcare. The company also organizes sensitization workshops to raise awareness, challenge biases, and equip managers with the skills to lead diverse teams effectively. As BSES operates across various office locations in Delhi, with a view to facilitate transition back to work, BSES offers location flexibility i.e. option to work out of office nearest to home.

E. Support Networks: No. of formal mentorship programs created, feedback, no of women attending the peer discussions, testimonials by successful women

An informal outcome of the WePOWER SAR100 program is the support network that has been formed between the 101 women of the first cohort. Taking advantage of social media and communication tools, these women have maintained a close-knit group, supporting each other in technical, professional and personal challenges. An initiative like this could go a long way in correcting the information asymmetry and unequal ability to network that mid-career women professional face. As Faria Haque Pushpo from West Zone Power Distribution Company Ltd., Bangladesh says in her testimonial, “Participation in the WePOWER-SAR100 training program opened doors to mentors, peers, and experts. This experience broadened my vision and perspective on the energy sector by fostering my technical skills and leadership potential.

Table 1 provides a year-wise summary of the number of women trained and their graduation percentages across various technical cohorts including SAR, AWS Cloud, and Quest Global. It highlights participation and completion rates for 2024 and 2025.

Table 1: Women’s Training and Graduation Summary

Year	2024	2025
No of women trained in SAR	101	100
Percentage of women graduated	100%	100%
No. of women trained in AWS Cloud Cohort	36	23
Percentage of women graduated	80%	Ongoing
No. of women trained in Quest Global Cohort	115	Yet to start
Percentage of women graduated	90%	NA

VII. Conclusion

It is evident from the analysis of the IEEE Returning Mothers Initiative and the WePOWER SAR100 Training that well designed trainings for mid-career and women attempting a return to careers can strengthen their bids to make a comeback, and make career advancements. While the two programs individually might not meet all the counterattacks needed to break the existing barriers, programs like these are complimentary and can leverage on each other.

It is important that training in leadership skills like negotiation, integrating gender inclusivity and creating support networks that the both the initiatives have been able to impart are kept as end goals and not just by-products of technical trainings. An explicit focus on these are required to be considered as investments into fostering women who would be willing to advocate for the cause, creating inclusive leaderships and breaking the social and personal barriers.

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