

Executive Summary

The under-representation of women engineering in India is a cause for concern for varied reasons. Firstly, it implies half the population is denied opportunities to contribute towards the development of the nation. Hence, the abilities and talents of half the population are neglected. Secondly, this is a cause for concern for organizations as well, as the competitive success for an organization in today's competitive global marketplace is dependent on diversity in its human resources. Diversity helps enhance creativity, develop products considering needs of different consumers and improves decision making. Also, organizations invest huge amounts on employees by way of recruitment, training and benefits and if women engineers cannot be retained long enough then returns on that investment can be lower and possibly in the negative as well (Maskell-Pretz & Hopkins, 1997). By projecting a more pluralistic image, businesses can increase their pool of potential customers (Powell, Bagilhole & Dainty, 2009). Furthermore, participation of women in engineering is also important for improving the quality of life of women and essential for national development (Parikh, Bindu and Sukhatme, 2003).

The objectives of this study are:

1. To examine the challenges faced by Indian women engineers in pursuing their careers.
2. To explore the sources of support and different coping strategies used by women engineers that were useful in navigating their journeys.
3. To examine factors influencing the satisfaction and well-being of women engineers.

We conducted two qualitative studies and one quantitative study to explore experiences of women engineers and present female engineering students. Participants who had completed engineering had graduated from 1990-2014 from various engineering colleges in India. By doing this we attempt to cover a cross-section of women engineers and see patterns in their experiences. Furthermore, for this project I used a mixed methods approach to overcome limitations of a single method to throw light on support and challenges faced by women engineers and their impact on women's self-efficacy, job satisfaction and well-being.

The thematic analysis of Study 1 shows the presence of stereotypical beliefs about engineering in society as a male-dominated profession. This results in discouragement being given to female students from choosing engineering from different quarters. Also, their journey as engineering students is marred by exclusion and isolation which limits their learning and preparation for life after completing their education. At the same time diversity promoting initiatives like supernumerary seats creates challenges of reverse discrimination as in a highly competitive environment they are perceived as taking a scarce resource despite being undeserving. Negative treatment from various quarters results in self-doubt and lowers feelings of competence amongst female students. Parents, teachers and friends are seen as sources of support by female students.

The thematic analysis of Study 2 revealed that gender discrimination and biased treatment exists in organizations today towards women engineers. Women are treated to different forms of microaggressions, micro inequalities and denied voice in organizations. All these aspects create a chilling and negative work environment for women engineers. Further, while organizations do provide various forms of accommodations to women to assist in their work-life balance specially for young mothers, these are used only by women and that results in derailing their career growth along with the perception that women are not fully committed to work. These experiences tell us that work family narrative is not the only reason for women's

slow career growth in organization, in fact may not be a reason at all. Secondly, engineering is a profession where different biases exist towards women not because of their lacking technical abilities but because of their communal traits, which are not aligned with agentic traits like competition and assertiveness, goal attainment needed to succeed in engineering. Further, the diversity initiatives result in token service and reverse discrimination towards women. The work family conflicts emerging from traditional division of labour in homes are also an important challenge. An important strategy by which women cope with these challenges is by re-strategizing career growth to balance home and work. Also organizational policies and practices that allow for work-family balance are useful too and in the Indian context help from part-time full-time house helps, grandparents help in taking care of children are useful. Some important coping strategies used by women are learning and upskilling oneself, prioritizing and accepting trade-offs between family and work demands. Finally, they learn to accept these challenges and find ways to work around them and continue their journey.

The multiple regression analyses (in Study 3) was conducted to examine the effects of gender discrimination, family support and perceived supervisory support on self-efficacy, job satisfaction, work engagement and subjective life satisfaction. The results show that perceived supervisory support influences self-efficacy in women engineers, while gender discrimination and family support relate with job satisfaction and subjective life satisfaction. Work engagement is related to family support only.

Another important finding on examining the level of growth women have had in their careers we found in study 2 and 3 the maximum number of participants were middle level managers in organizations. Some comments of our participants had also shared that their growth was slower than their male colleagues.

Recommendations

Bridging the gender gap in engineering will not happen overnight however, based on the above findings I would like to bring out certain recommendations for policy makers and organizations so that engineering is a profession identified with gender equality.

1. In organizations and educational institutions, it is important to increase awareness (through programmes and workshops) about different stereotypical beliefs that influence one's decision making and behaviour and ways one can use to avoid these stereotypes.
2. Organizations and educational institutions should clearly articulate what behaviours are treated as negative aggressive behaviours and zero tolerance towards them.
3. Designing teaching content to make boys more gender sensitive.
4. To make diversity programmes more effective it is important to communicate criteria for using them, reasons for using them and how these do not imply compromise on abilities.
5. Encourage both men and women to use family friendly policies and avoid punishing those who use them.
6. Training women to speak up more, highlight their achievements and reskill them if needed to keep them relevant in the job markets.
7. Train managers/supervisors to learn to deal with different employees in different ways appropriate for each to encourage and support them.
8. Create opportunities for women to grow to leadership positions.