RETENTION STRATEGIES FOR WOMEN IN ENGINEERING IN KENYA.

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ABSTRACT

Kenya's capacity to grow economically and compete in global markets depends on its ability to innovate using engineering to transform its vast natural and untapped human resource capability into value added products, processes and services. This requires harnessing the potential of its population through education and training to create a critical mass of experts in engineering innovations and as well providing equal access for both women and men in Engineering. The number of women who pursue engineering programmes in higher education institutions are fewer than men. Furthermore, the ability to retain these women in the engineering fields is hindered by suppressed motivation and other unique gender related challenges. The result is that allover Kenya there are few practicing women engineers. The Kenyan Government has included in its regulations the gender inclusivity at its work place by creating the famous a third gender rule in recruitment processes. Also, there is the inclusivity in the procurement of government where there is inclusion of tenders for women and the youth.

The retention of women in Engineering profession requires actions at all levels using different strategies including creation of relevant policies, acquisition of relevant skills to meet market demands, mentoring, capacity building, advocacy, the role of female engineering networks and use of role models. This paper seeks to discuss issues hindering retention of women engineers in the profession and strategies to improve retention of women engineers in the profession.

Key words: *Retention, Strategies*

INTRODUCTION

Gender inclusivity in Engineering field has been a challenge in many countries over decades at times declining, though some countries search has India, Turkey and Singapore have been able to reduce the gender parity and gaps in engineering (Bhuvaneswari Ramachandran, 2020). Globally there is underrepresentation of Female Engineers despite the various cultural differences, there are common issues that can be attributed to these low numbers. There are low numbers of female students enrolling in Engineering as compared to other courses in tertiary levels of education (San Juan, 2006) and this is a similar scenario in Kenya. Despite the few female students training in engineering, only a handful end up practicing as engineers, a number of them deviate to other professions. The deviation from Engineering has been given various explanations over the years, for instance the biological and social differences between women and men, work-family balance attributed to work load and nature of jobs of an engineer and even differences in general interests and abilities of ladies (San Juan, 2006).

All genders have similar reasons for enrolling in engineering. Most argue that being good at math and science in high school and wanting interesting, well-paid professional opportunities in the future are reasons of joining the profession. However, women, more often than men, add that they want to become socially responsible engineers, working to solve major problems and making a difference in people's lives (Silbey, 2016).They both excel well in their studies and mostly the female students get very good grades. Mostly, the Female engineering students start to deviate early from the career during studies, where most lack mentors to guide them through. Professional courses introduce students to its distinct culture, skills, language, practices, and values and for engineering students observe and practice these through group projects, where they learn how to think and act like engineers. They quickly discover that collaboration and teamwork constitute a core component of being an engineer. For many female engineering students, however, their first encounter with collaboration is to be treated in gender stereotypical ways, mostly by their peers. When working with male classmates often relegated to doing routine managerial and secretarial jobs, and of being excluded from the "real" engineering work (Silbey, 2016).This lowers the confidence of the female student engineer in tackling engineering related issues (Bhuvaneswari Ramachandran, 2020).

During internship period where the engineering student is learning the roles of an engineer and the culture at work place, the female engineer will find very few lady engineers she can associate with and guide her through and the gender stereotyping here also echoes what is happening in the university and more often she is assigned lighter duties as compared to male counterparts. Men are assigned interesting problem-solving tasks where they could develop their analytic and technical skills, while women are often assigned jobs sorting papers, copying, collecting equipment, writing notes, and coordinating tasks they felt did not value or cultivate their skills (Silbey, 2016). Further, many women discover in their internships that the engineering profession is not as open to being socially responsible or as dedicated to tackling pressing national and global problems as they had

hoped. This is a result of the assignments they are given, the values that are supported, and the messages that are communicated to them.

Other professions search as law, auditing and medicine the number of female practitioners is almost the same as the male counterparts, thus, this study seeks to understand the reasons why there are fewer ladies in the engineering profession and also come up with strategies to retain most of the female trained engineers within the profession as from the introduction the few numbers of ladies in the engineering field is cultivated very early in life, during their studies. This gender parity in engineering nationally should be a concern to the government, educators and also businesses.

METHODOLOGY

This study uses existing literatures on women in Engineering practice, history of women in Engineering and female students in engineering. The data obtained from the various literatures is further compared with what is currently happening in the Engineering field in Kenya from observation.

RESULTS AND DISCUSSION

CHALLENGES FACED BY FEMALE ENGINEERS IN PRACTICE.

It is expensive to train an Engineer both financially and timewise and thus the expectation is for the trained personnel to use the knowledge and skills gained during study to fuel economic growth. In reality this is not the case as there are many challenges in practice for both genders but this is more pronounced in Female Engineers due to the few numbers in practice. The various challenges faced by female trained engineers which make them not to practice or quit the profession include: -

- Lack of female mentors and role models.

From the student life of an engineer one is likely to encounter very few female lecturers or none this imprints a picture of a male dominated career at a very early stage of the career.as a female engineer progresses from student life, internships to work life they need female engineers who can guide, mentor and even assist in tackling issues unique to female engineers but in most cases they are few or none at all in most organisations, this lead most to leave as they feel they in the wrong career pathway.

- Gender stereotypes in the engineering field

Stereotype threat in the engineering profession is a perception many in the society have, thus its engraved early on the children that men are better engineers, thus leading to the men domineering factor in the field of engineering, but the few ladies who pursue the engineering career actually perform equally well as their male counterparts.

- Lack of awareness about possible career pathways

This is not only affecting female engineers but also the male engineers. Most come out of campus without being really sure what is expected of them in the field of practising engineering. Just like the career choice from high school, where most chose a career out of the grades achieved most are not sure of the various career pathways after training as an engineer.

- Work life balance

Engineering jobs are so demanding timewise to a point that it impacts the work life balance. This especially related to balancing work and taking care of family especially young children. The compensation from engineering jobs also in most cases in the initial years is not appealing and also enough to enable the lady to pay for quality childcare while working full time and if one takes a break to take care of the child re-entry to engineering is not easy. Also, often meetings are scheduled outside of childcare hours, there is a lot of had travel expectations, and heavy workloads which coupled with child care becomes hectic (Nadya Fouad, 2017).

- Working conditions

There is the prevalence of values associated with the male gender role in workplace culture (Franzway Suzanne, 2009). Most of the jobs in the industries have been run by men for decades and in most cases the integration of women into the factories is a challenge to many. The facilities are not gender friendly. Also, the working in shifts in manufacturing industry try to shun most women with families to take care of.

- Not meeting expectations.

Many female engineers feel the that most of their skills are not fully utilised in the profession, many to work in other environments that better utilized their abilities thus the exit from the profession. The use of analytical, research, and writing skills that one developed during engineering training as well as use my compassion, creativity, multidisciplinary thinking, and cross-cultural values and skills in the profession is lacking (Nadya Fouad, 2017).

STRATEGIES TO RETAIN LADIES IN ENGINEERING

The challenges leading female engineers exit from the career are diverse in nature but similar across all cultures. There some measures that if put in place at least more ladies will practice engineering and even join the engineering as a career of choice in high school.

- Gender mainstreaming

In order to compensate for the underrepresentation of women Engineering, the country should use gender mainstreaming as a tool for establishing gender equality. Gender mainstreaming is the systematic integration of gender equality into all policies and programmes, organisations and their cultures (San Juan, 2006). In Kenya one major effort by the government is a third Gender Rule in employment and even introducing procurement rules that accommodates the youth, disabled and women.

- Engineering Education

The Engineering stereotyping can be tackled through the curriculum and problems be tackled through pedagogy. The engineering curriculum is often traditional, created by men, and the working examples often relate to male perspectives. Female engineering students often find themselves in classes that are predominantly male, with few, if any, female professors or lecturers.

Schools could play a positive role in highlighting the salience of gender in career, including the gender gap in courses search as Engineering. A strong high school curriculum in math and science provides more opportunities for concrete experiences and competence and provides a partial antidote to gender stereotyping and the discouragement of female students' interest in the field of engineering (Bhuvaneswari Ramachandran, 2020).

- Mentorship

A mentor is a role model who has first-hand information about her profession, she has knowledge and experiences in it. A female engineer can encourage young women to choose a non-traditional education and profession. She can also aid women to understand the hidden structures in industry, especially in heavily male dominated fields. A mentoring program for women engineering students will help women in their careers, build networks and encourage them to stay in the profession (San Juan, 2006). The importance of having role models and mentors to one's professional growth and progress includes establishing a mutual exchange of knowledge and experiences between the mentee and mentor and thus enhance understanding of women's skills and competence in general, and encourage personal and professional development and heighten self-esteem.

- Advocacy and Awareness of Engineering

Use of media, social networks and also parents and guardians to advocate for engineering profession to the girl child will increase the numbers enrolling for the course and eventually those who practice. This is because this will increase positive awareness about the field of engineering to female students, it may be important to start awareness/ advocacy in primary school and continue the efforts in high school. This would lead to sustained interest in the subject, improved recruitment percentages and increased retention rates in engineering colleges and in practice.

- Female engineers' role models

Female engineers in leadership within the engineering field are encouraged to initiate talks with high school students and also university students, this is part of mentorship but also the students will probably find role models in the field they can identify with. Access to role models and mentors influences successful professional development. Young adults identify with successful female role models whose presence allows them to think: "If she can be successful, so can I" and "I want to be like her" (Bhuvaneswari Ramachandran, 2020).

The faculty in engineering should also consider having some female lecturers and even female professors as this also form part of role models who will influence them to have interest to practice engineering after the training.

- Inclusive workplace norms and environment

Workplace environments whether positive or negative influence the attitude of the employee towards the job. Workplaces that have work-life initiatives embedded in family supportive cultures influenced the satisfaction, commitment and withdrawal intentions of female engineers (Nadya Fouad R. S., 2011). Also, work places where the employee's contributions are acknowledged and valued tend to retain their employees.Workplaces where there is respect to all, create a friendly environment for employees to thrive and be committed to their

duties without unnecessary worries, thus encouraging retaining of female engineers in the career. Also, mentorship within the work environment, lets one to be able to gain confidence in thir duties. To maintain a good number of female engineers also ensure the organisation has gender friendly facilities.

CONCLUSION

This research main goal was to understand why there are low numbers of female engineers in practice and also try to propose strategies to maintain the few within the profession. It is clear that the main challenge is the perception of the engineering culture by the society which need to be addressed right from primary school. Advocacy for the Engineering profession as a rewarding career, varied profession with many opportunities and with female engineer role models is therefore very key in unpacking the general belief that engineering is a male oriented profession. Mentorship is also encouraged so as to be able to attract female students into engineering courses and also, retain them in practice.

Work-life balance should be an emphasis in most workplaces as women professionals tend to not only have to deliver the targets at work but also, they have a family to take care of and in most cases young children. Gender balance is required in engineering as it improves productivity and steers economic growth.

REFERENCES

Bhuvaneswari Ramachandran, C. R. (2020). Advancement of Women in Engineering: Past, Present and Future. *American Society for Engineering Education*.

Franzway Suzanne, S. R. (2009). Engineering Ignorance: The Problem of Gender Equity in Engineering. *Frontiers: A Journal of Women Studies.*

Nadya Fouad, R. S. (2011). *Stemming the tide: Why Women leave Engineering.* Milwaukee.

Nadya Fouad, W.-H. C. (2017). Women's Reasons for Leaving the Engineering Field. *Frontiers in Psychology*.

San Juan, K. R. (2006). Retaining Women in Engineering Education Through Network Groups and Mentoring. *9th International Conference on engineering Education*, (pp. 4-11). oslo.

Silbey, S. (2016). *Why Do So Many Women Who Study Engineering Leave the Field?* Havard Business Review.