Why do women leave engineering? How can we retain them?

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Abstract

Retention of women in engineering, which is mostly a male-dominated field is still a problem. Data from the Engineers Board of Kenya show that as in 2021, 2,124 (12%) out of a total of 17,731 engineering graduates were listed. Even though the number of engineering graduates for women is lower than that of men, the attrition rate from engineering for women is higher, which affects the diversity of women engineers at the workplace. Some of the reasons for leaving engineering are attributed to self-doubt, resulting from cultural beliefs that it's a masculine profession. In addition, the feelings of being undervalued for one's contributions, gender stereotypes at the workplace, assignment of managerial roles when one is interested in the technical roles, work-life balance issues with little flexibility, and lack of mentorship in the engineering space. This paper will discuss why women are leaving engineering and potential retention strategies. It's imperative to note that mentorship, promoting gender balance, creating diversity awareness at the workplace will improve diversity and inclusion.

Keywords: Retention, Diversity and inclusion, attrition, women engineers, retention strategies

1 Introduction

The Underrepresentation of women in the Engineering fields has been an outcry in society for many years. Researchers, policymakers, and educators have conducted various studies to try and understand the reasons for the low numbers. Fouad et al.. (2017) indicate the funds' government institutions have spent in STEM (Science, Technology, Engineering, Mathematics) education to increase the number of women in STEM. Over the years, awareness of the need to encourage women to pursue STEM has been on the rise. Through her explorations on ways to increase STEM numbers in university, Mbirianjau(2016) recommended the need to implement new policies by the government that encourage the participation of women in STEM. There has been an increase in mentorship for high school students to encourage girls to pursue science courses. Still, despite the interventions, the data from the Engineering Board of Kenya as of 2021 show that numbers of women graduates are still low and make up 12% (2124) out of 17,231. The low numbers indicate the long way we have to go before achieving gender diversity in engineering. Despite the low numbers, we have women who complete the rigorous five-year program and still leave the engineering field for various reasons contributing to lack of diversity in the workspaces. Walker(2021), states that deficit of talent and innovation at the work is due to lack of talent. She goes ahead to note that, increased diversity in engineering fields will contribute to greater economic success.

Subsequent researchers have been trying to understand the basis of leaving the engineering field and the exit rate (Hunt, 2016; Fouad et al., 2017; Singh et al.., 2018; Beasley et al., 2012). Sometimes, reasons for leaving engineering can be as subtle as feeling less valued at the workplace by male counterparts, which becomes discouraging over time (Cardador & Caza, 2018). Work-family conflict is one of the contributions to reduced commitment to the engineering profession. Singh et al., 2018). When it comes down to balancing work and family, the commitment tends to shift from work to family and finally exiting the occupations as a whole.

One gap identified during the research is the limited research on the attrition rate for women in the engineering field in Kenya. This paper will discuss valuable insights as to why women leave engineering as a whole using survey collected from those still practising and those who left the profession. The paper uses both desk study and an online survey to understand and address areas in the profession that need fixing and shed light on various factors.

2 Materials and Methods

Data collected was through an online survey in August and September. A survey link was shared through WhatsApp and other social media platforms in different women engineering groups and to individuals. The target group was graduate engineers, professional engineers and those women engineers who left the profession or are in the process of seeking alternatives to leave the profession. I encouraged the women to share with their colleagues and other female engineers, of which some complied. A total of 74 women participated in the survey. Those who participated were from private entities, working in the government, entry-level graduates, mid and senior levels, working with NGOs, job seekers, and those who exited the profession. I also combined an online survey with secondary research to get more insights into the matter.

Out of those who filled the survey, 5% were students, 7% didn't practice after graduation, and 14% left the field after a few years of practice. The survey questions were ten and were open-ended, which allowed users to express themselves. I used the responses for qualitative analysis. I used the analyses to report the results. I used a number of questions which include the reason why they think other women exit the profession, what were the challenges they faced as women engineers, which was subdivided into sections, what were their opinions in tackling issues facing women engineers, and how easy was it to acquire employment opportunities, how can more women be retained in the engineering profession, do they feel there is diversity in their area of work and opinions on how we can increase diversity in engineering. Some respondents gave one-sentence answers, while others wrote up to five sentences. An average of 1216 recorded sentences were recorded.

3 Results

I grouped the comments made from respondents into groups as per similarity. Repetitive responses were summarized into one. I used Dedoose app in the qualitative analysis of the answers to each question. Below is a chart showing the results of the qualitative analysis for why women decide to quit engineering.

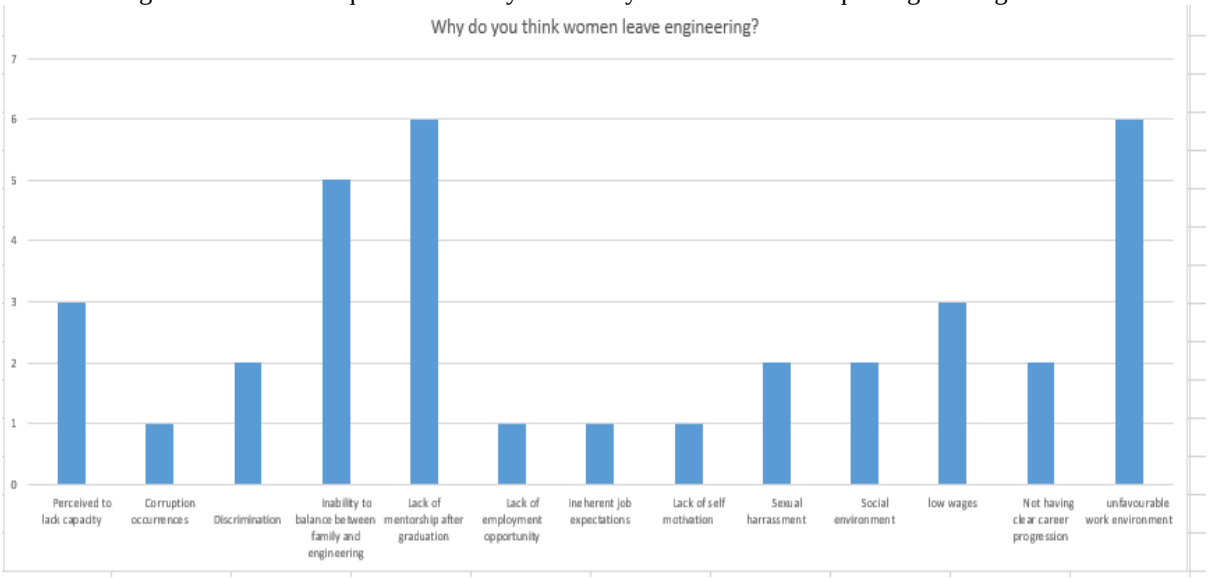

Fig. 1. Show the responses women gave on reasons to quit engineering.

3.1 Work-life balance

Balancing work and family pose a conflict to some lady engineers, and a "balance between work and family time is hard to achieve." Many women expressed that taking care of family, especially when kids are young and tackling engineering tasks, can be intense.

3.2 Gender stereotypes

Many women noted discrimination at the workplace due to their gender and indicated that their supervisor preferred giving them minor secretarial jobs and not technical tasks. "Heads at work would sometimes prefer giving more tasking activities to the men than women, thus denying them a chance for the experience." This

discouraged them from continuing in the same workspace, especially "having to prove to my male colleagues that I am as capable as they are."

3.3 Lack of mentorship

Many women noted that the lack of mentorship geared them toward leaving engineering as they did not know how to maneuver the engineering workspace and felt like they "lacked proper mentorship and encouragement think that they chose the wrong field".

3.4 Lack of recognition for one's contribution

Some women expressed feelings of being undervalued in their place of work, especially by their male counterparts. They indicated that their contributions were not valued and felt "oppressed by the male counterparts."

Other reasons noted was a change of interests and sexual harassment at the workplace

3.4 Retention strategies

Many women noted that "more women mentors should come up to offer moral and career support to the young engineers." Most women suggested reducing gender stereotypes by "opening up the more friendly work environment and enforce gender rule." The women suggested the need for "inclusivity and equity especially to women raising children" to improve work-life balance and also improve flexibility at work. Other essential factors that the women pointed out were the need to create equal opportunities for men and women, equal pay, and employing more women in the engineering space.

Below is a graph showing suggestions of women or retain women engineers.

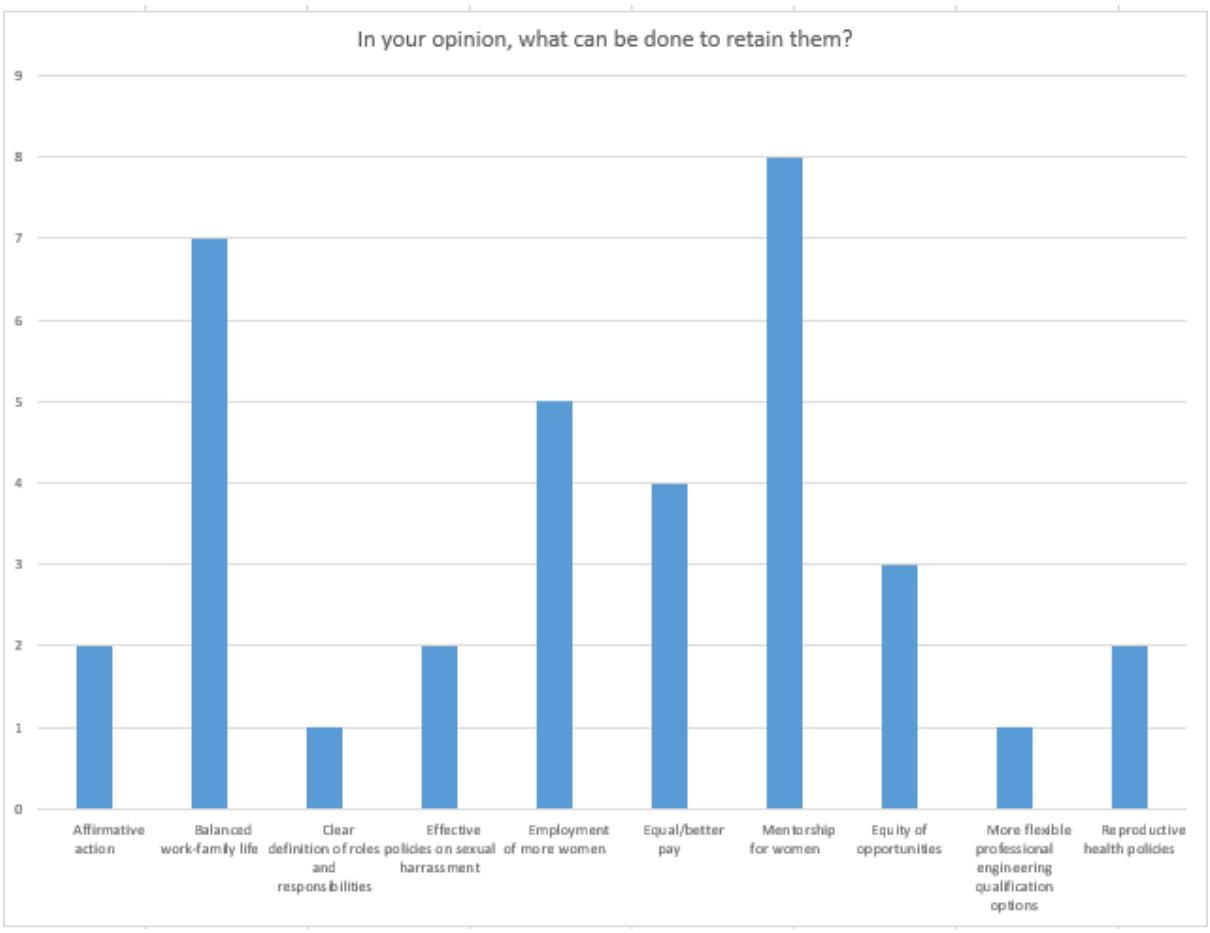

Fig. 2. Shows suggestions on how to retain women engineers.

4 Discussion

The purpose of this study was aimed at providing insights into why women engineers in Kenya leave the industry and how we can retain them. Having a low number of women in the engineering field begs the need to

maintain those already practicing in the area. In the Dedoose app, I conducted a qualitative analysis of the 74 women who participated in the survey analyzed various factors that contributed to women leaving the engineering profession. According to the analysis, the attrition in the engineering profession was due to unmet needs and lack of fulfilment felt by the women engineers. From the analysis, six overarching needs came out: little or lack of recognition for one's contribution, lack of mentorship, gender stereotype, work-life balance, loss of interest and sexual harassment. I suggested that such when such factors arise, women are likely to look for alternatives and from this research. Generally, the results provide definitive answers to research five questions posed. The first research question posed to understand reasons that lead to leaving the engineering profession. As from the results and comments made, there is a mismatch between fulfillment of their desires and the work environment. The Second question regards their suggestion on how to improve the situation. From results and comments, the women show a great understanding of what needs to be done such as provision of mentorship and professional development. The third question posed was about issues faced by a woman engineer. The comments show that women are face issues such as work life balance and sexual harassment which can then lead to attrition. The fourth research question posed is if there is inclusion and diversion at their work place. The results and comments indicate the low number of women at the workplace. The fifth question revolves around what can be done to increase diversity at their workplaces and the result and comments indicate the need to increase opportunities for women and enforce gender parity at the workplace. According to Singh et al.. 2018, the work-family relationship contributes to the turnover of women engineers, and that has been confirmed to be a contribution from the women in this study. The research has shown that the dominant need is mentorship and professional development which is a gap that needs to be filled by established female engineers and partners in the field. Offit(2015) noted that mentorship is vital for the success of female engineers. When women leave the profession, diversity in the profession is highly affected. Hence, companies should improve the retention of women engineers by creating diverse and inclusive environments and enforcing equal pay (Angie,2019). I suggest that companies employ policies that do not discriminate against women and encourage women's participation in increasing innovation in the industry.

5 Conclusions and recommendation

The research draws various conclusions from study. First, the effects of work-life balance on the rate of turnover of women engineers. Second, the lack of a proper framework for mentorship and career guidance for entry-level graduates. Lastly, the unfavorable work environment discriminates against women and undervalues their contributions. Therefore, companies and shareholders in the engineering field should allocate resources and make corrections needed to retain more women in engineering and improve diversity in the area. It should be noted that, there is need for established mentorship and professional development program for women engineers to reduce rate of turnover. There is need to create a favorable work environment where there is a gender rule to protect women engineers from gender stereotypes. Also, there is need to create flexible program that accommodates women with young ones to improve work-life balance. Hence such implementations will reduce women engineers turnover.

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