Group 21

Complimentary studies 441

Assignment 1

Topic: How do engineers ensure that the gender gap is addressed in industry?

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# Introduction

To reach a consensus of what the gender gap is, and to come to grips of its relevance in industry, different information sources were reviewed. These sources include literature, a discussion with an organisation, and people with experience in industry.

Our initial interpretations (shown in Appendix A) were that the gender gap can be quantified by the difference in wage between men and women taking up the same positions within a company. In addition to this, is the unequal representation of each gender in management positions. After grappling with content, we realised that the gender gap refers to a lot more than representation issues and wage differences. Workplace bias, prejudice, and unregulated company cultures act as additional barriers for women entering many industries.

To better understand what the gender gap entails, we consult two individuals with different experiences in their respective organisations. The interviewees were chosen such that they each provide differing perspectives on the matter. After the interviews, a discussion with Mercedes-Benz is summarized, and is followed by a literature review. This experience allowed us to address the issue of a gender gap in a less biased approach and evaluate our findings objectively.

# Lived experiences

Our first interview was held with Dr Selina Palm. Dr Palm’s diverse experience in industry, and research in gender dynamics, makes her the perfect candidate to aid our interaction with the gender gap.

As an opening point, Dr Palm advised our group to consider a qualitative perspective, as opposed to a quantitative perspective, when interacting with the gender gap in industry. A quantitative approach would analyse the data, whereas a qualitative approach documents and analyses lived experiences. Currently, there is a wealth of conflicting data relating to the gender gap. This data ranges from differences in pay, to gender dynamics in industry, and to representation statistics.

Dr Palm’s main points related to her qualitative research, and observations of workplace bias. This workplace bias manifest itself in ‘gendered professions’, where certain jobs are more suited to certain gender norms. Even after the removal of explicit barriers preventing women entering the working industry, lack of participation is still evident. Currently, there is a strong unregulated, and informal culture that makes it harder for women to compete in many industries. This culture also rewards masculine tendencies in the corporate workplace. Thus, increasing the scope of the problem: it is no longer about getting women into industries; it is also about changing industry culture to be more accommodating to women’s participation.

The second interview we held was with Daniel Conradie, an industrial engineer at Mercedes Benz in East-London. In his field, he explains that the gender gap in industry was largely related to the small number of females available in the automotive industry. Stigmas surrounding woman also add to this gap. Daniel views men as more rational beings and women as more emotional beings.

Regarding workplace bias, current legislation provides preference to women when hiring. This gives women a competitive advantage entering industry. Because of this, there is not equal potential for participation and progression in the workplace. Daniel believes that to reduce the gender gap, if there is one, is to provide equal opportunities based on qualities and strengths and not legislative quotas.

From these interviews we conclude that, unfortunately, industry was initially built for masculine participation and excluded women. Many efforts have been concentrated to encourage the participation of women in industry. However, many informal obstacles and cultures, enforced through history, still act as barriers that prevent equal opportunities for genders to participate in industry.

As engineers, we have a responsibility to shape society with the input of technology. These barriers preventing participation limits the input of perspective we need, to shape society. Thus, resulting in us shaping society with extreme tunnel vision. To address this issue, Dr Palm spoke of adaption as opposed to anarchy. A lot of these issues can be addressed through some form of anarchy. Throwing over the system will remove the blatant issues. However, it will also introduce many other issues. Adaption offers a different solution. In a changing society, we must decide how we want to change, and optimize the workplace to provide this change.

# Organisation or programme conversation

Mercedes-Benz's understanding of the gender gap is that traditionally their field was reserved for men, with women less frequently hired. Currently at Mercedez-Benz, there is no wage difference between people of the same qualification and experience, of different genders.

Mercedes-Benz has attempted to combat the gender gap in various campaigns over the years. First of which, in South Africa, was after 1994. Since them, Mercedes has been encouraging women into the workforce of the production of vehicles in East London. Including women into this industry helps further the goal to diversify and close the gender gap in automobile employment.

Another campaign worth mentioning, started in 2019. Mercedes-Benz intends to combat the stigma or notion that the automotive industry is directed at men. The campaign combined Mercedes-Benz with Mattel, a toy manufacturing company. It aims to advertise and market the automobile industry to young girls and women, challenging stereotypes and leaving a lasting impact. Finally, teaching them valuable lessons about female role models and opportunities available in the automotive industry.

Mercedes-Benz follows the South African affirmative legislation. The Employment Equity Act promotes equity in the workplace, ensures that all employees receive equal opportunities, and that employees are treated fairly by their employers (Western Cape Government, 2019). Application of this act encourages employment opportunities of previously disadvantaged groups. It also encourages employment of women within industry.

These are all important measures that need to be taken. However, it only addresses the problem of poor female representation in the automobile industry and does not challenge the bigger problem of the existing workplace bias.

# Key ideas in literature

## Article 1: Women in STEM: A Gender Gap to Innovation

Within this paper, the authors took a quantitative approach to present the gender disparities, which includes earnings and managerial positions that exist in science and engineering.

Although females make up 48 percent of the workforce, females make up only 24 percent of the STEM workforce. This implies that half as many females work in STEM employment as one would expect if the general workforce was reflected by gender representation in STEM professions. Furthermore, this underrepresentation of women in STEM has remained constant in the past decade (at 24 percent) even though in 2009 about 49 percent of the tertiary-educated workforce (STEM and non-STEM) was women. The study also points out that only 18 percent of all females pursuing tertiary education in STEM chose to do so in engineering, compared to 48 percent for their male counterparts. Moreover, of all the women that obtained college education in STEM, only 26 percent choose to further their career in STEM, as compared to 40 percent of men (Breede, et al., 2011)

Looking at the wages earned in STEM, it is obvious that there are clear disparities between the wages earned by males compared to those earned by females. On average, males and females in the U.S. earn $36.34 and $31.11 per hour in STEM employment respectively. Although females in STEM usually earn 33 percent more than those in non-STEM employment (Breede, et al., 2011). Finally, males dominate the managerial roles within STEM. Breede et al. (2011) stated that males fill 75% of managerial roles.

While it was not the intent of the authors to provide reasons for this under-representation and income gap for women in STEM, factors that may contribute toward this was noted. Unfortunately, there are relatively few female role models that exist in STEM. Men and women typically make different choices in response to incentives in STEM education and STEM employment – e.g., STEM jobs may be less accommodating to someone that finds themselves in and out of the workforce to raise a family.

## Article 2: Gender Gap in STEM: Current Knowledge, Implications for Practice, Policy, and Future Directions.

An overview of an article out of the Educational Psychology Review Journal Volume 29 (March 2017), pp 119-140.

This article covers women underrepresentation of women in Science, Technology, Engineering, and Mathematics (STEM) fields using empirically supported data with the social cognitive theory as a theoretical guide. The social-cognitive theory is a perspective which focuses on observing other people and learning from their actions. This information is based on research from fields including psychology, sociology, economics, and education over 30 years prior to 2017.

There is still a large gender gap in Mathematics-intensive STEM fields although this gap in other fields have narrowed significantly. Research shows that girls are more likely to have high verbal and math abilities, where boys are more likely to only possess high math ability (Wang et al. 2013). It is more likely for a person with a dominating mathematical aptitude to use this difference in cognitive ability as a guide to steer him/her in the direction of a more mathematical-intensive career. If on the other hand a person possesses high math and verbal abilities, he/she is more likely to pursue another career path because they have a much wider variety of options. This leads to more males pursuing careers in the STEM fields than women.

The lead causes for the gender gap in the STEM careers according to the author is a combination of differences in interests and cognitive ability between men and women. Therefore, the focus should be on the enhancement of their interests and abilities.

Cultivating interests in subjects like Maths and Physics for girls at school should be a big priority. Because females are also more likely to pursue a career in something to make positive contributions to their society, these STEM fields should be advertised as careers that are compatible with these views.

# Conclusion

After interacting with the issue, it is evident that there is a gender gap in industry. This “gap” addresses more than wage differences between genders representation of genders within industry.

Although quantitative research about this issue is important, qualitative research also needs to be done to gather information about the experiences of people in the working environment. Through quantitative and qualitive research it is concluded that this gender gap exists and prevents the participation of people in industry. Workplace bias, stigmas, and prejudice result in “gendered professions”. These challenges need to be addressed and a workplace must be created to accommodate both genders.

# References

Breede, D., Julian, T., Langdon, D., McKittrick, G., Khan, B., & Doms, M. (2011). *Women in STEM: A Gender Gap to Innovation.* Washington: U.S. Department of Commerce.

Wang, MT. & Degol, J.L. Educ Psychol Rev (2017) 29: 119. <https://doi-org.ez.sun.ac.za/10.1007/s10648-015-9355-x>

# Appendix A

Alexander Thorne, View:

I believe that there are certain stigmas surrounding some industries that may discourage women to pursue a career in that particular industry of interest. This may be caused by that industry not being accommodating to women, or by having a bias of choosing men over women. The goal is to provide equal opportunity for both men and women by removing these stigmas and promoting unbiased decisions when hiring.

Werner Van der Merwe, View:

The gender gap can be regarded as the representation of each gender in the workplace, specifically the lack of female representation in, for example, STEM fields. The extent of the gender gap is more prominent the higher up in a business one looks. Women are outnumbered by men on boards and in most managerial positions within a company, as a result they earn less money on average.

Cilliers Steyn, View:

Looking at the gender representation in the engineering industry from a statistical perspective the disparities is undoughly clear. Women are underrepresented and do not participate as much as men in the industry. For me, the unequal split between women and men is not the problem, the problem is that workplace bias prevents women to fully collaborate and to do so with equal opportunities as compared to men.

Dewalt Snyman, View:

In the workplace women still make employment choices that they do not necessary want to due to comfortability. The reason why they don't choose a career they want to, is that they feel that being in certain employment areas they experience less grief in the workplace and can pursue their career more comfortability. Thus, I believe that there is a gender gap due to the stigma women have within certain career areas that they are less inclined to be there. This created a causality in women’s mindset that they should not pursue certain jobs when being compared to men.

Dean Pretorius, View:

Historically, the workforce has always been dominated by men. In recent years, attempts have been made to address these issues preventing women contributing to the work force have. However, there is still much to be done, as is evident in the disparities in opportunity, satisfaction and pay between men and women in the work force.

CG van Aardt, View:

I think that there is a gender gap in the industry, but this does not necessarily mean that it is a “problem” that needs solving. Men instinctively likes certain subjects more than women and vice versa and therefore there will be a natural difference between the number of men and women in each profession. This gender gap is only because the interests of men and women differ and is not because men or women are forced into a direction.