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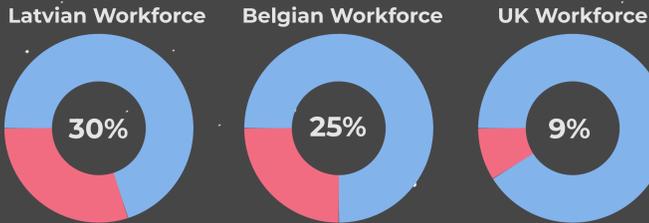
WOMEN IN ENGINEERING

Why is there a gender imbalance in the number of engineering professionals and how could policies be implemented to resolve this?

#1

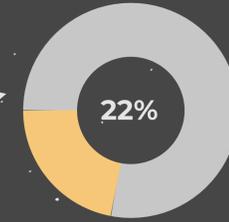
Gender Divide

Gender diversity remains a key issue in the engineering sector with females accounting for only 9% of all engineering and technology employees (IET, 2015). This is the lowest percentage of female engineering professionals in Europe with countries such as Latvia and Cyprus achieving a representation of 30% female engineers.

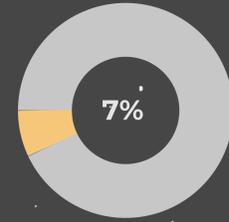


Despite entering into the 'Year of Engineering' in 2018, the UK has a long way to go to attract and retain enough people to ensure the future of the sector continues to be successful. Current statistics suggest that less than a quarter of A-Level Physics students are female while less than 7% of engineering apprenticeships completed are by women. Advancing, through to higher education, only a fifth of applications to engineering courses are made by women.

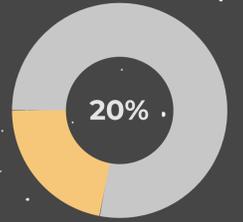
A-Level Physics Students



Engineering Apprentices



Engineering Degree Applicants



The projection for the number of graduates entering engineering is 20,000 fewer than needed which is of substantial concern as forecasts suggest that 2.65 million engineering jobs will need filling by 2024. As the engineering sector generates over a quarter of the UK's GDP, it is vital that the government heavily invests in ensuring that as many people as possible pursue engineering roles. These targets will not be reached if half the population feel excluded from the industry in some way.

Previous research highlighted many issues which could cause this divide. Misconceptions of engineering as a profession is considered a key cause of the gender divide, particularly at an early age. For example, stereotypes of engineers as male mechanics or 'gas engineers' are considered more common.

Retaining female engineers is also a common problem with many women citing their families as a reason why they left their engineering careers as they were unable to work part-time in the industry. The IET found that in 2015, only 6% of engineering companies offered flexible working. Although there has been a push on flexible working initiatives since then, barriers to promotion and returning to work continue to be problem areas.

#2

Method



Questionnaires have been distributed to females within the engineering community - either current students or working professionals - to gain a quantitative and qualitative insight into the opportunities, experiences and views of women within this sector. The survey was split into sections of 'Information', 'Motivations', 'Background', 'Problems' and 'Change' to gain as much of an insight as possible.

Over 200 females responded to the survey, providing a valid representation of the engineering community. An analysis of the results formed the basis of more in-depth qualitative information gathering through one-on-one interviews. Professionals with first hand experience have been interviewed to provide further detail of the characteristics and issues of the industry.

These results along with range of feminist literature and information on governmental policy will then be used to identify potential reasons for the lack of female representation in the sector, to link the empirical results of the dissertation to key debates, and to provide the basis for offering solutions.



Anonymous Questionnaire



200+ Responses



Compared with government policy and feminist literature

Results

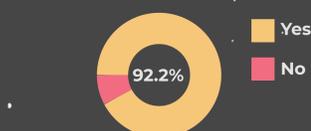
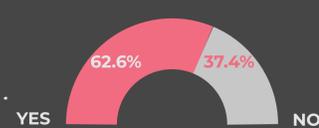
The survey found that 63% of female engineers felt uncomfortable in their working environment due to gender. Similarly, 61% had experienced sexual discrimination or harassment in this environment. The IMechE's study on the experiences of female engineers confirms these results, finding that 63% of female engineers had personally experienced unacceptable behaviour or comments. This highlights why there is a problem of retention in but also why females may choose to enter a different industry or role after graduating. The culture of engineering is therefore an issue that needs to be addressed, particularly within higher education and the workplace.

Although over 90% of females engineers agree that changes need to be made in order to increase women entering professional engineering roles, the way in which this is achieved was more divided. 50% of participants agreed or strongly agreed with positive action, however, over a quarter of participants disagreed or strongly disagreed with this method.

While over 40% of the female engineers surveyed identified primary school as the most effective level to encourage females to work within an engineering role, 34% identified Year 7-Year 9. This suggests that the majority of participants believed that the earlier the encouragement, the more effective it would be. Particularly before students select subjects at school.

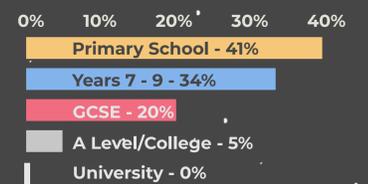
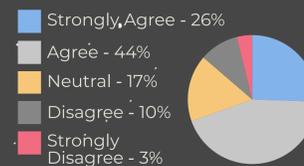
A method to increase the number of females entering engineering careers is to change the stereotypes of engineers. 70% of participants agreed or strongly agreed that stereotypes of engineers discourage women from studying engineering. If the misconception of engineers was tackled, more females would consider engineering as a career choice.

"Have you ever felt uncomfortable in your working environment because of your gender?"



"Do you think any changes need to be made in order to increase women entering professional Engineering roles?"

"Do you agree or disagree that stereotypes of engineers discourages women from studying engineering?"



"At what level do you think encouraging females to work within an engineering role would be most effective?"

#3

Conclusions

The gender divide in the UK engineering sector is evidently one that needs improving. In addition to educating and inspiring young females about STEM subjects, an effort must also be made to change the perception of 'engineering'. The IMechE quote a student who, when asked about engineering, stated that "We think it's important but we don't quite know what it is". It is this problem that perhaps needs to be the focus of governmental investment. In looking at what the government could implement, there is no one solution. In order to significantly increase the number of women in engineering, improvements need to be made in multiple areas. Within schools, it is hoped that campaigns such as the 'Year of Engineering' will be successful in starting to change the perception of engineering and inspire young people to consider engineering as a career path. The government, however, needs to ensure that this continues and is embedded in the system to ensure that teachers, as well as students and parents, are aware of engineering as a career choice and work towards changing gender stereotypes in subjects such as physics. Parallel to this, career education needs to improve across schools in the UK to ensure students are aware of engineering as a career option and fully understand what it entails.

The research has so far been successful in gaining the views of the engineering community, receiving over 200 responses surpassing the initial target of 20. It will continue to compare the results of the research with feminist literature and information on governmental policy to explain why there is a gender imbalance in the number of engineering professionals and how policies could be implemented to resolve this.

WHAT NEXT:



Change perceptions of the "Engineer"



Promote the study of STEM subjects



Increase opportunity for flexible working



Improve Career education