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Dismantling barriers faced by women pursuing engineering in higher education to facilitate widening access: a UK perspective.

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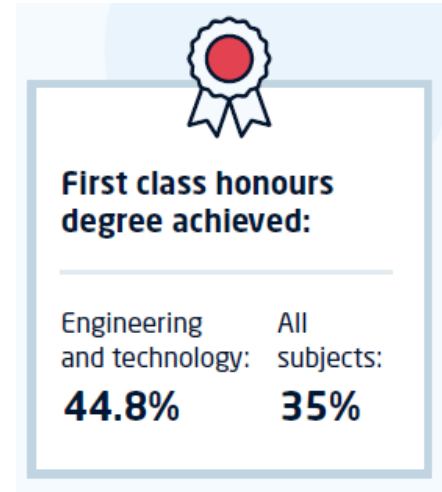
2024

Dismantling Barriers Faced by Women Pursuing Engineering in Higher Education to Facilitate Widening Access: A UK Perspective

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Engineering & Technology in UK HE

- Proportionately **larger increase in all students**, at 14.0% compared to 5.2% between 2009/10 and 2020/21^{1,2}.
- 5th most popular subject group when looking at all levels combined^{1,2}.
- **Mechanical Engineering** is the most popular subject for undergraduate study at 22.5%^{1,2}.
- **Electronic and Electrical Engineering** is the most popular subject for postgraduate study (taught) at 19.4%^{1,2}.
- Higher proportion of minority ethnic entrants than all other subjects^{1,2}.

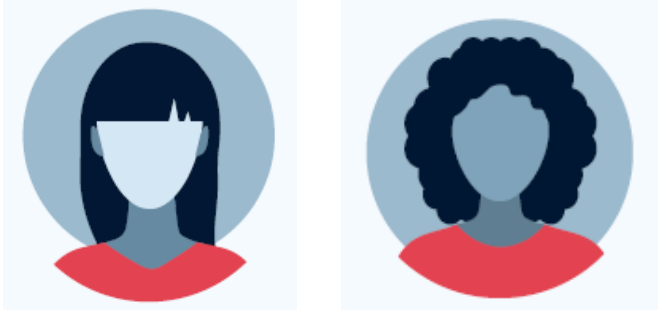


Comparison of 1st degree honours achievement outcomes (EngineeringUK, 2023)

Top HE study subject for students studying both Mathematics and Physics at A level.

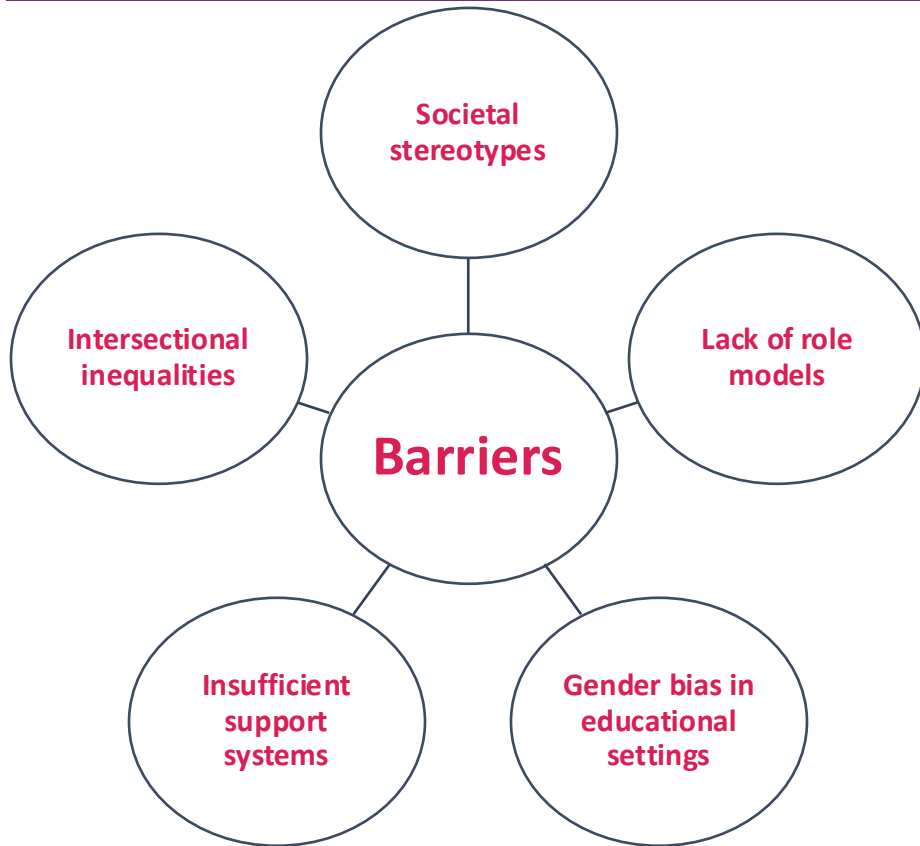
Engineering & Technology in UK HE: Females

- 18% of first year undergraduates, compared to 57% across all subjects^{1,2}.
- 26% of taught postgraduate courses, and 28% research postgraduate courses^{1,2}.
- **Chemical, Process and Energy Engineering** is the most popular subject for undergraduate study, 29.1%^{1,2}.
- 23% of males who studied Mathematics and/or Physics went on to become engineering and technology undergraduates, compared to 8% of women³.
- 115,000 more girls would need to study Mathematics and/or Physics at A level to reach equality in undergraduates³.



UNDERREPRESENTATION

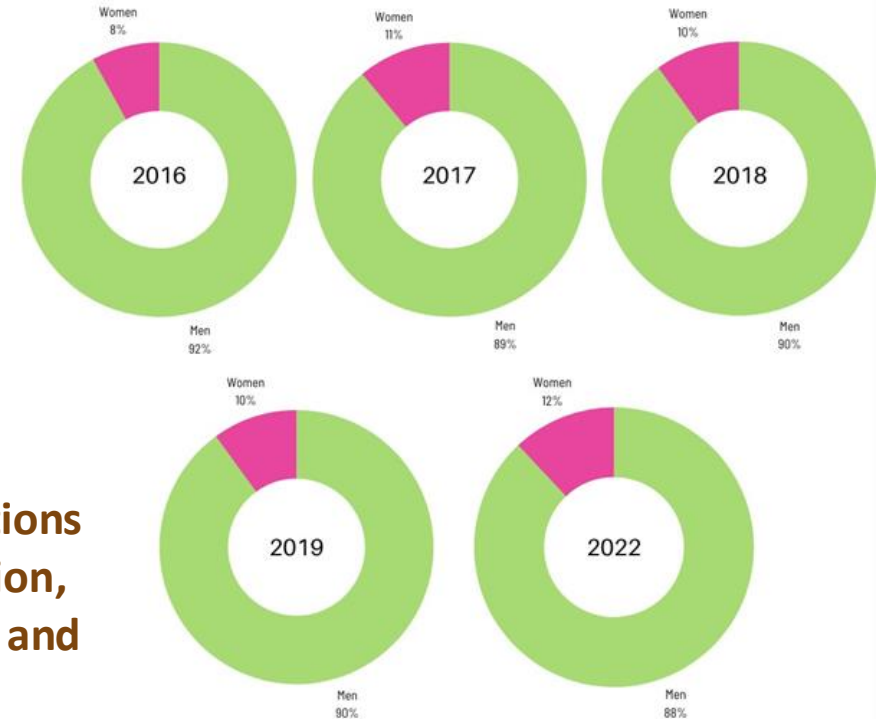
Barriers to Female Enrolment



Main barriers to females pursuing engineering in HE settings (EngineeringUK, 2023; RAEng & NBS, 2023)



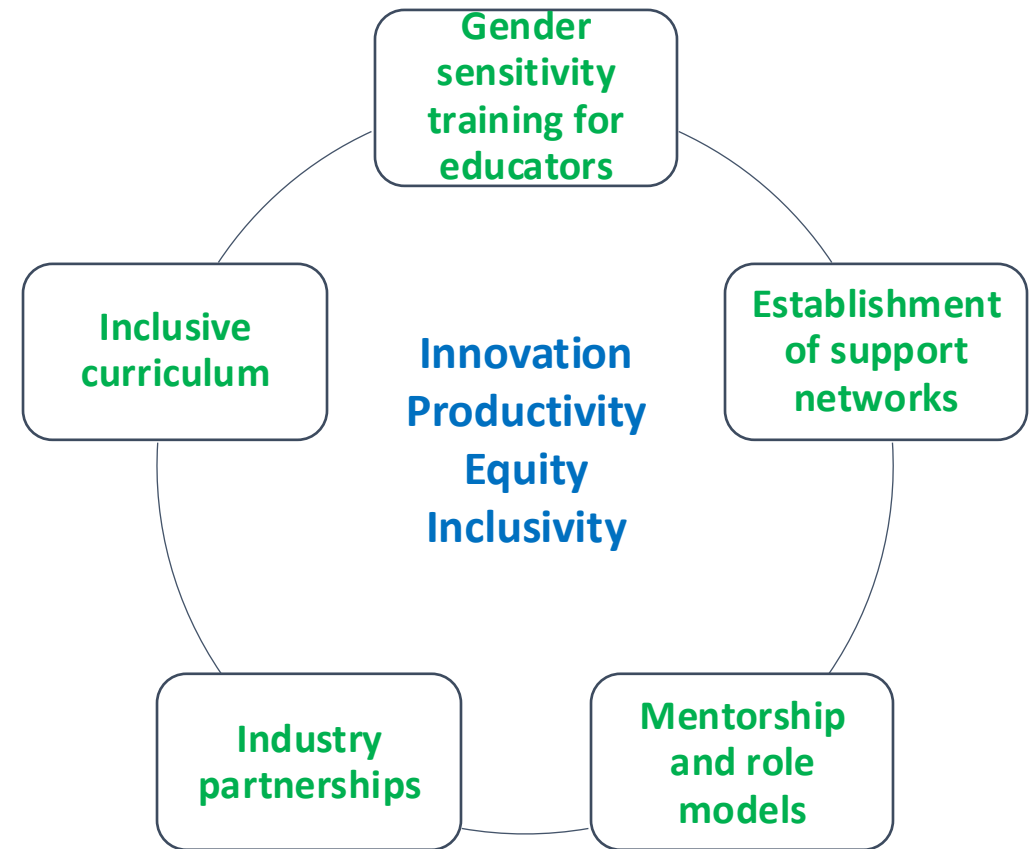
Leads to implications related to retention, attainment rates and employability



Engineering professionals in relation to gender makeup between 2016 and 2022 (STEM Women, 2023)

Bridging the Gap: Enabling Environment

- Advocacy for increased funding to support research focused on systemic change⁴.
- Establishment of scholarships and financial aid to reduce financial barriers.
- Institutional policies and practices to promote anti-discrimination and flexible learning pathways⁴.
- Development of targeted outreach programmes, workshops, and partnerships with schools.



UK Case Study: Rolls-Royce

- Collaborated with the Singapore Girl Guides since 2014 to launch the **Science Investigator Badge** to inspire girls to take an interest in science and technology.
- **Generation Aerospace Programme**, started in 2015, excites young ones, regardless of gender, bringing to life a future shaped by tomorrow's technologies and solutions.
- **Catalyst Hack**, started in 2019, is an all-female hackathon in London, to design a concept for a gaming app to inspire the next generation of girls in STEM.
- Platinum sponsor of the **Girls in Tech** programme in Singapore, where female engineers receive advice with mentors.
- Engages young talents in STEM through play and theatrical methods, in an initiative known as **STEAM**.

UK Case Study: Programmes and Initiatives

- **National Engineering Week** and the **Girls Who Code** initiative provide 'hands-on' STEM experiences, mentorship, and resources to help young women visualise themselves as future engineers.
- **International Women in Engineering Day (INWED)** encourages more young women and girls to take up engineering careers.
- **My Skills My Life** programmes provides resources and support to encourage girls and women to pursue STEM careers.
- **STEM Ambassadors** serve as role models, helping to break down stereotypes and encourage girls to consider engineering career.



Support Mechanisms serving as a Pipeline

Summary

- **Engineering is evolving**, with women playing an increasing role in shaping its future.
- Complex barriers limit female participation in UK HE engineering courses.
- Addressing these barriers will enhance innovation and productivity in the engineering workforce through diversity of thought and experience.
- Continued advocacy, mentorship, and supportive initiatives, are required to foster a more inclusive environment.
- Overall, systemic change can create a supportive and enabling environment for women to **thrive** in engineering.

4 QUALITY EDUCATION



5 GENDER EQUALITY



References

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