

Key facts for diversity and inclusion in engineering

This document was produced by the DILG Communications Action Group in July 2017 and will be reviewed on a regular basis.

Sources

- EngineeringUK Report 2017: www.engineeringuk.com/research
- Useful 'at a glance' key facts interactive wall from EngineeringUK: <http://www.engineeringuk.com/research/at-a-glance-2017>
- SEMTA – Engineering Skills for the Future: <http://semta.org.uk/images/pdf/Engineering-Skills-for-the-Future-Report---Final---November-2016.pdf>
- Equality Challenge Unit - Equality in higher education statistical report: <http://www.ecu.ac.uk/publications/equality-in-higher-education-statistical-report-2016/>
- WISE – Not For People Like Me: <https://www.wisecampaign.org.uk/resources/2015/09/not-for-people-like-me-research-summary>
- WES – Diversity in Engineering: <http://www.wes.org.uk/sites/default/files/u82/Diversity%20in%20Engineering%20Data%20Summary%20FINAL.pdf>
- CaSE: Improving Diversity in STEM: <http://www.sciencecampaign.org.uk/resource/ImprovingDiversityinSTEM2014.html>
- The Royal Society: A picture of the UK scientific workforce: <https://royalsociety.org/topics-policy/diversity-in-science/uk-scientific-workforce-report/>
- InterEngineering report: Tackling Homophobia in Engineering: www.interengineeringlgbt.com/tackling-homophobia-in-engineering
- *New Civil Engineer* survey, 2015, Rakesh Ramchurn: www.newcivilengineer.com/business-culture/survey-lifts-lid-on-homophobia-in-the-sector/8687868.article
- Royal Academy of Engineering – several sources can be found here: <http://www.raeng.org.uk/policy/diversity-in-engineering>

Key facts about engineering relating to the following areas:

Gender

- **Workforce:** In 2015, women made up just over one fifth (21%) of the engineering workforce, but only accounted for one in eight (13%) of those in engineering occupations. They comprised an even smaller proportion (just under 10%) of engineers and technicians working in engineering enterprises (the 'core' engineering workforce).¹
- **Graduate starting salaries:** Overall, there was a relatively small gender pay gap for engineering graduates in full-time employment six months after graduating in 2014/15 (male engineering graduate

¹ State of Engineering report 2017 figure 3.10

mean salaries were £93 higher).² However, there was variation by discipline. In electrical and electronic, production and manufacturing, and chemical, process and energy engineering, male graduates' starting salaries were around 5% than their female counterparts. In other disciplines, such as among mechanical engineers, women's mean salaries were higher than men's (2% higher in mechanical engineering).³

- **Secondary school:** Although roughly half of GCSE Physics entries were female (49%) in 2016, just over one in five A-level Physics entries are female (22%). There is research to support the importance of the learning environment in influencing subject choices. For example, an IOP study conducted in 2012 found that girls were 5.5 times less likely to take A-level physics than boys in mixed state maintained schools; this was lower in other types of schools, notably single-sex (2.7 times less likely).⁴
- **Apprenticeships:** In 2014/15, 7% of engineering-related apprenticeships were held by women. In some engineering disciplines, this was as low as 3%.⁵
- **Higher education:** Only 15.1% of first year students enrolled on first degree engineering and technology undergraduate courses were women in 2014/15; women were particularly underrepresented in mechanical engineering (9.4%), aerospace engineering (10.1%), and electrical and electronic engineering (12.8%)⁶.
- **Degree attainment:** In 2013/14, 74.7% of female full-time first degree qualifiers studying engineering and technology obtained a first/2:1, compared with 68.9% of BME qualifiers (a degree attainment gap of 5.8 percentage points). This was comparable to the gender degree attainment gap across qualifiers studying STEM subjects (5.4 percentage points).⁷
- **Perceptions:** According to EngineeringUK's 2016 Engineering Brand Monitor, compared with boys, girls reported less positive perceptions of engineering (32% c.f. 61%); knowledge about what people working in engineering do (20% c.f. 39%); were less likely to perceive a career in engineering to be desirable (30% c.f. 55%); and reported less awareness about what to do next to become an engineer (19% c.f. 32%).

Age

- **Apprenticeships:** The age profile of engineering-related apprentices is markedly younger than across apprentices overall. In 2014/15, the largest proportion of apprenticeship starters across all sector subject areas were 25 or older (47%) while 28% were under 19. In contrast across all engineering-related sector subject areas, over 40% of those starting an apprenticeship were under 19, with only a quarter aged 25 or older.⁸
- **Higher education:** In 2013/14, 59.4% of higher education students studying engineering and technology were aged 21 and under. This was slightly higher than across STEM subjects (54.9%).⁹
- **Perceptions:** The proportion of young people who reported considering a career in engineering was larger among the younger age groups, with 54% of those aged 11-14 reported they would consider a career in engineering, compared with 46% of those aged 14-16 and 37% of those aged 16-19. However, reported knowledge of what an engineer does and the desirability of an engineering career were

² State of Engineering report 2017 table 8.14

³ State of Engineering report 2017 section 9.1.2 and table 9.1

⁴ Institute of Physics: It's different for girls – the influence of schools, 2012.

⁵ State of Engineering report 2017 pg. 95.

⁶ State of Engineering report 2017 table 7.4

⁷ Equality Challenge Unit, 2015

⁸ State of Engineering report 2017 table 6.5.

⁹ Equality Challenge Unit, 2015

comparable across the three age groups (with reported knowledge ranging from 27% for those aged 11-14 to 32% of those aged 14-16, and similarly, desirability ranging from 41% of those aged 11-14 to 45% aged 16-19).

Ethnicity

- **Degree attainment:** In 2013/14, 77.1% of UK-domiciled white full-time first degree qualifiers studying engineering and technology obtained a first/2:1, compared with 61.8% of BME qualifiers (a degree attainment gap of 15.3 percentage points). This was slightly higher than the BME degree attainment gap across qualifiers studying STEM subjects (13.3 percentage points).¹⁰
- **Graduate employment:** Among UK domiciles who had undertaken a first degree in engineering full-time and found employment six months after graduating, 73% of employed white graduates went into the engineering sector in 2014/15, compared with 58% of BME graduates. This proportion was particularly low among black graduates (50%)¹¹. These findings are consistent with those of the Royal Academy of Engineering, which found that even after controlling for such factors as degree attainment, employability outcomes for BME graduates were weaker than for white graduates¹². The study also found that these differences were greater among engineering graduates than those in other subject areas.
- **Ethnicity pay gap:** Six months after graduating, BME engineering graduates in full-time work earned on average £507 less than their white counterparts¹³. The pay gap was particularly wide for Black engineering graduates (£24,924) compared with white engineering graduates (£26,220 – a difference of £1296).

Disability

- **Degree attainment:** In 2013/14, the proportion of first degree qualifiers receiving a first/2:1 was comparable across disabled (69.2%) and non-disabled (69.7%) engineering and technology students¹⁴.
- **Graduate employment:** Overall (not engineering-specific), there are differences in employability outcomes for disabled students compared with non-disabled qualifiers. In 2013/14, 60.5% of non-disabled leavers were in full-time work six months after graduating, compared with 53.2% of disabled leavers overall.
- **Disability Student Allowance:** Support for disabled students is also changing. In 2016/17, for example, the support offered as part of Disability Student Allowance (DSA) was reduced and primary responsibility for delivery (eg. provision of non-medical support roles) was shifted to HE providers.

Sexual Orientation

¹⁰ Equality Challenge Unit, 2015

¹¹ State of Engineering report section 8.4.2

¹² State of Engineering report section 8.5

¹³ State of Engineering report table 8.15

¹⁴ Equality Challenge Unit, 2015

- **Attitudes and productivity:** The engineering industry is losing a potential £11.2 billion due to lesbian, gay, bisexual and transgender (LGBT) engineers remaining in the closet due to a 30% reduction in productivity¹⁵
- **Attitudes:** One in four gay employees in the construction industry has personally experienced offensive comments about their sexuality in the last 12 months. More than 60 per cent have heard offensive or inappropriate comments in the workplace, and over half have heard the word 'gay' used as an insult.¹⁶

Maternity/returners

- A WES survey of more than 500 women with a STEM qualifications, looking at the area of retention and the effect of a maternity break on women's careers. 60% of the women surveyed found barriers to returning to work after a maternity break. Of this group 67% of those that are not currently in a STEM career would like to return to one.¹⁷

¹⁵ Tackling Homophobia in Engineering pg.5

¹⁶ *New Civil Engineer* survey, 2015

¹⁷ *Women in STEM: Are you IN or OUT?*, 2014