CREATING CULTURES WHERE ALL ENGINEERS THRIVE: DIGGING DEEPER

1   INTRODUCTION

This report, *Digging Deeper,* presents the collated headline findings and key trends in engineers' experiences of culture and inclusion in the engineering profession. It should be read as a supplement to the publication *Creating cultures where all engineers thrive: a unique study of inclusion across UK engineering*[1], published by the Royal Academy of Engineering in 2017.

Creating cultures presents insights from a survey of 6799 engineers conducted in 2017, and has a particular focus on inclusion and gender, ethnicity, age and company size.

Digging Deeper gathers together key insights from further analysis of engineers' experiences of culture and inclusion. These are linked to demographics, engineering sector and discipline, base (where engineers work), registration status and grade. Appendix A gives a list of the additional reports that this report summarises.

A key finding from the 2017 *Creating cultures* report was that most engineers feel positive about the culture of engineering and perceive that the culture of engineering is inclusive. 82% of engineers already feel 'very' or 'quite' included in the engineering profession, and 76% of engineers feel the culture of engineering is 'very' or 'quite' inclusive. However, the 2017 report also found that age, gender and ethnicity appear to make a small but consistent and statistically significant difference to engineers' experiences of inclusion. For instance:

- Engineers aged 46 and over feel less included in the profession than those in the younger cohorts (18% of those aged 46 to 55 feel 'not very included' in the profession, compared to 12% of those aged 25 and under).
- Male engineers are almost twice as likely as their female colleagues to perceive the culture of engineering as 'very inclusive' (21% of men perceive it as very inclusive, compared to 11% of women). They are 1.5 times as likely as women to say that they feel 'very included' (35% and 23% respectively).
- White engineers are significantly more likely than their BAME colleagues to feel 'very included' in the engineering profession (34% of white engineers said this, compared to 24% of BAME engineers).

The headlines from the additional analysis are that:

- other respondent demographics (disability, religion and sexual orientation) also make a difference to the experience of culture and inclusion in engineering, with disability making a particularly notable difference

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[1] Creating cultures where all engineers thrive www.raeng.org.uk/inclusivecultures

- there are some differences in the experience of inclusion based on grade and registration status
- sector, discipline and base appear to make relatively little difference to the experience of inclusion.

2   HEADLINES: DEMOGRAPHICS

2.1   DISABILITY

5% of survey respondents (354 individuals) described themselves as having a disability (such as sensory, mobility, cognitive or developmental).

The survey findings are clear: disabled engineers experience the culture of the engineering profession as less inclusive than their non-disabled colleagues. Overall, 31% of disabled engineers described the culture of engineering as 'not very/not at all' inclusive compared to 22% of engineers without disabilities. Disabled respondents recorded less positive responses than respondents without disabilities on questions relating to all seven indicators of inclusion described in the 2017 report. However, three indicators stand out as most likely to be driving down their experience of inclusion. These are:

- Leadership. Disabled engineers rated their managers less positively on questions relating to respect, and on their commitment and ability on diversity and inclusion.
- Careers. Disabled engineers are less likely than their non-disabled colleagues to consider key processes such as recruitment, promotion and work allocation to be fair (63% of disabled engineers believed that external recruitment process is fair compared to 80% of non-disabled colleagues).
- Disabled engineers are more likely to feel isolated at work, and to have experienced and witnessed bullying and harassment than their non-disabled colleagues (27% vs 13%).

2.2   RELIGION

A total of 6,631 respondents (98% of the total) provided information about their religion. The vast majority of engineers either have no religion (49%) or are Christian (41%). 2% are Muslim and 1% are Hindu. Combined, the numbers of engineers who reported they are Buddhist, Jewish or Sikh make up just 1% of respondents. A further 4% of respondents preferred not to say and 2% selected the 'other' box on religion.

Given the very low number of respondents self-identifying as Sikh, Jewish and Buddhist, this report presents findings from Christian, Muslim and Hindu respondents only, along with respondents with no religion. The survey findings show that Muslim respondents experience engineering as less inclusive than other respondents.

- 78% of respondents with no religion, 77% of Christian and 76% of Hindu respondents experience the culture of engineering as quite or very inclusive. However, only 64% of Muslim respondents described the culture in this way.
- 83% of respondents with no religion and 81% of Christian respondents feel quite or very included in the engineering profession, while 77% of Muslim and 76% of Hindu respondents agreed.

Muslim respondents are also less likely than any other group to say they enjoy their job most or all of the time (67% of Muslim respondents said this compared to 81% of Christian and 85% of Hindu respondents). They are also less likely to recommend engineering as a great career choice to friends and family (83% of both Christian respondents and those with no religion said this compared to 75% of Hindu respondents and 70% of Muslim respondents). This is an important concern for the future of the profession. Muslim respondents make up 25% of respondents aged 25 and under, compared with Christian respondents who make up just 6%.

Respondents from across all religious groups most commonly chose *informal and friendly* to describe the culture of engineering. However, Muslim respondents are most likely to say that they've experienced bullying or harassment in the past 12 months (26% of Muslim respondents said this, compared to Hindu (17%), Christian (14%) or respondents with no religion (13%)). Both Muslim and Hindu respondents are also more likely than Christian respondents or those with no religion to say that 'people make assumptions about me because of my nationality/ethnicity'.

2.3   SEXUAL ORIENTATION

A total of 6,609 (97% of all respondents) shared information about their sexual orientation in the survey. The majority of respondents were heterosexual (91%), 5% preferred not to say and 4% were lesbian, gay, bisexual (LGB) or described themselves in the survey as 'other'.

Overall, LGB respondents are less likely than heterosexual respondents to describe the culture of engineering as 'very or quite' inclusive. 53% of lesbian and 56% of gay engineers described the culture as 'very or quite' inclusive compared to 78% of heterosexual respondents.

The data shows that around half of all LGB engineers do not feel able to be open about their sexual orientation at work. They are *less likely* to say 'I can be open about my sexual orientation' (55% lesbian, 48% gay, 53% bisexual respondents say this, compared to 90% of heterosexual respondents), and less likely to say 'I feel I can be myself in my organisation' (63% lesbian, 77% gay and 77% bisexual respondents say this, compared to 88% of heterosexual respondents)

Lesbian respondents are much more likely than gay men and heterosexual respondents to experience bullying and harassment. 30% of lesbian respondents experienced bullying and harassment in last 12 months compared to 16% of gay men and 14% of heterosexual respondents.

2.4   EUROPEAN (NON-UK)

There were almost no significant differences in the responses from EU engineers and respondents overall regarding their experience of inclusion. This includes responses to questions about intent to remain in the profession. 14% of EU engineers are planning to leave the profession for reasons other than retirement in the next 12 months, or are undecided about doing so, compared with 13% of all respondents.

However, there is one notable and significant difference that hints at a less positive experience for European non-UK respondents. Over twice as many EU engineers agreed that 'people make assumptions about me because of my nationality/ethnicity' compared to all respondents. 39% of EU respondents agreed with this, compared to just 19% of respondents overall.

3   HEADLINES: GRADE, REGISTRATION AND SIZE

3.1   GRADE

There are few significant differences between how engineers at different grades experience the culture of engineering, or their experiences of inclusion. Where differences do exist, it is non-managers who appear to experience the culture less positively and feel less included than other grades. For instance:

- Non-management respondents are less likely than all other grades to describe the culture of engineering as 'collaborative' (46% of non-management respondents described it as this compared to 55% of graduates and senior management respondents).
- 79% of non-management respondents said that they feel very or quite included in the engineering profession compared to 85% of graduates and managers, and 89% of senior managers.

The factors driving down the experience of inclusion for non-management respondents relate to the extent to which they feel listened to by leaders (only 45% of non-managers feel listened to by their leaders compared to 79% of senior managers), and to their experience of career processes. Non-management respondents were less clear than other respondents about what they need to do to progress in their career, less likely than other respondents to agree that work is fairly allocated, and less likely to say the promotions process is fair.

3.2   REGISTRATION

48% of survey respondents said that they are registered engineers.

In small but significant ways, registered engineers experience engineering culture slightly differently to their non-registered colleagues. While overall there is no difference in how inclusive the two groups perceive engineering culture overall to be, non-registered respondents feel less included in the engineering profession than their engineering colleagues (87% of registered engineers said they feel very/quite included, compared to 77% of non-registered respondents).

Among the factors driving down the feelings of inclusion for non-registered respondents are their perceptions of the fairness of processes related to recruitment and progression. Registered engineers are *more likely* than their non-registered colleagues to see the external recruitment process as fair and transparent (81% of registered engineers said this compared to 76% of non-registered respondents), and to see the promotions process as fair (58% of registered engineers said this compared to 51% of non-registered respondents).

3.3   SIZE

While there is little difference in the extent to which SME and corporate respondents experience the profession as inclusive, SME respondents are more likely to describe their *organisations* as inclusive, with 45% of SME respondents saying they feel very included in their organisations compared to 34% of corporate respondents.

4   HEADLINES: SECTOR, DISCIPLINE AND BASE

There are few significant differences in the experience of inclusion according to the sector, discipline or base (main job location) of respondents.

- Civil engineering respondents were more likely than respondents in other disciplines to report feeling very included in their organisations, and that the culture of their organisations is very inclusive. They are more likely to say they feel respected and listened to by leaders and managers (43% said they feel listened to by their managers all of the time, compared to 36% of all respondents), and they are more positive about career processes such as recruitment and progression. 68% of civil engineering respondents are clear what they need to do to progress their career for instance, compared with 55% of respondents overall.
- Defence engineers experience their organisations as less inclusive than respondents overall (25% described their organisational culture as very inclusive compared to 33% of respondents overall). One of the key factors driving down perceptions of inclusion for defence engineers is their experience of career processes such as recruitment and progression. Only 44% of defence engineers felt the promotions process is fair, for instance, compared to 54% of respondents overall.
- Software engineers experience the culture of engineering as more collaborative and innovative and less hierarchical than engineers in other disciplines (58% vs 50% overall).

5   HEADLINES: OPEN TEXT RESPONSES

There were several opportunities in the survey for engineers to add their own comments and feedback on the culture of engineering and the experience of inclusion in the engineering profession.

Five recurrent messages emerged from analysis of these open text responses. The messages are consistent with the findings from other sources in the study (focus groups and quantitative survey responses):

- In the main, engineers were positive about the work they do, describing it as interesting, varied and challenging. However, they do regret the loss of engineering and technical skills as they progress into management roles.
- Engineers feel they are often misrepresented and misunderstood by the wider public, confused with someone who does domestic repairs ('washing machine' repair was mentioned several times). There were plenty of suggestions that the title of 'engineer' should be protected by qualification in the same way as a doctor or lawyer.
- Many respondents feel undervalued in terms of pay. There was a clear theme about the perceived low pay of engineers, in comparison with other professions such as doctor or lawyer.
- There is ambivalence and concern about how the practice and priorities of engineering are changing, away from a 'known' and tangible profession to a different and often unknown future.
- There was plenty of concern about the lack of diversity and inclusion in the engineering profession. But there was also ambivalence about how diversity and inclusion are being approached (in particular, concerns about positive discrimination) and some ambivalence about the value of diversity and inclusion to the engineering profession.

6   IMPLICATIONS AND RECOMMENDATIONS

The *Creating Cultures* report found that there are seven indicators of inclusion in engineering. These are:

1   OPENNESS: The extent to which engineers feel able to be open about who they are, and about their life outside work, and confident to speak up on inappropriate behaviour to themselves or other people, mistakes or safety risks, for instance.

2   RESPECT: The extent to which engineers feel treated with respect, by managers, leaders and colleagues, and don't feel that assumptions are made about them because of their gender, ethnicity or any other difference.

3   RELATIONSHIPS: How engineers relate to each other, and the extent to which relationships are friendly, collaborative, free of offensive banter, bullying or harassment.

4   CAREER: The extent to which engineers feel supported in their careers, by their manager and by the fair implementation of talent management processes such as promotion.

5   FLEXIBILITY: The extent which engineers have opportunities to work flexibly, without it being a barrier to career progression.

6   LEADERSHIP: The extent to which engineers are convinced by their managers' commitment and action on diversity and inclusion.
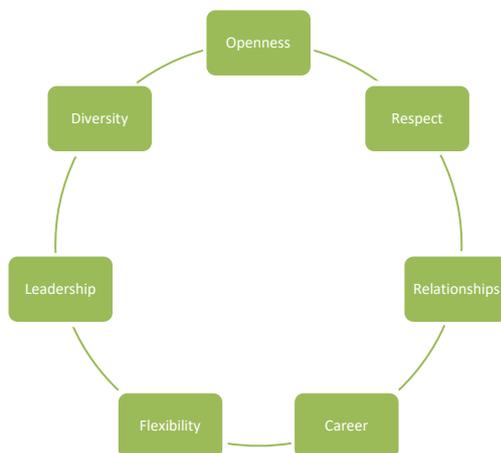
7   DIVERSITY: A diverse workforce at all levels.

Figure 2

Digging Deeper reiterates the findings of the *Creating Cultures* report, showing that there are many similarities, and some important differences, in how different demographic groups experience inclusion in engineering. Once again, being in a minority makes a difference, with disabled, Muslim, Hindu and LGB respondents reporting less positive experiences of inclusion than non-disabled respondents, Christian respondents or those with no religion, or straight respondents. This additional analysis suggests that the less positive experience of inclusion for minorities in the

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profession tends to be associated with less positive experiences of respect, relationships, leadership and career. *Creating Cultures* recommended building a critical mass of allies, increasing awareness, and taking action to ensure fair and inclusive career support and talent management. *Digging Deeper* reiterates these recommendations as the route to building a culture in which *all* engineers thrive.

APPENDIX A   Full list of additional reports

Creating cultures where all engineers thrive, published September 2017: analysis of engineers' experiences of inclusion linked to gender, ethnicity, age and company size.

Digging Deeper: summary of additional reports compiled December 2017 to April 2018, analysing engineers' experiences of inclusion linked to:
- demographics (disability, religion, sexual orientation, nationality (European non-UK))
- registration status and grade
- engineering discipline (aerospace, civil, defence, software)
- engineering sector (aerospace, construction, public and admin, shipbuilding, utilities)
- base (manufacturing, office-based, site-based)
- SMEs (small and medium sized employers)