



**HAYS** Recruiting experts  
in Engineering

# DIVERSIFYING THE TALENT PIPELINE

## Women in Engineering

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**Mike Morgan**  
Director  
Hays Engineering

### Introduction

What do engineers have to say about the gender balance in their workplace? There's plenty of enthusiasm around encouraging young women to enter the industry. But research shows that the sector faces an enduring challenge in attracting female engineers, who can potentially play a big part in addressing the sector's ongoing talent shortage.

Hays, in partnership with the Institution of Mechanical Engineers, has undertaken this study to acquire professional perspectives on what's at the root of the problem, and what measures are necessary to try to put things right.

Our results give a clear indication that change can only come if we engage with girls about what's available in engineering from a much younger age – and continue to do so through the educational process. 69% of female survey respondents, and 67% of men, think engineering not being pitched as a viable career option for women is a major factor behind its low take-up. An even larger majority worry that its reputation as a 'boys' job is still to be overcome. There's too little overall understanding around what opportunities are out there and of the different pathways that an engineering career can offer.

Encouragingly, a number of organisations are doing great work in educational establishments to challenge some of these misconceptions, something that Hays has been proud to get involved with recently. Many of our survey respondents also say their employers are taking measures to increase the numbers of young female engineers, often by linking with schools and universities.

We hope the findings in this report can help promote further positive steps by the industry to increase its intake of female professionals, as well as illuminating ways forward that can help us tackle the general shortage of talented young engineers.

**I would welcome any feedback that you might have. Please email me at [mike.morgan@hays.com](mailto:mike.morgan@hays.com).**

### Under-representation

The dearth of fresh talent entering the engineering sector is well documented. The Hays Global Skills Index 2014 report drew attention to the international scale of the challenge facing the profession, drawing on testimonies from America alongside a range of European countries. Meanwhile Engineering UK, a not-for-profit organisation promoting the importance of engineering to society, has identified a requirement of around 87,000 new engineers per year to meet national demand over the next decade. Its 2014 State of Engineering report found that only around 51,000 are currently graduating.

Among young women the shortage of incoming candidates is acute. Research published in 2012 by the Institute of Physics revealed that 49% of UK mixed-sex state schools had no female school-leavers follow on to do A-Level Physics, a key building block for a career in engineering, despite female students outperforming their male counterparts at GCSE level. Moreover, only 25% of female A-Level students have been going on to become engineers, indicating that huge potential is being lost at each staging post along the educational pathway.

That's not to say that positive steps aren't being taken to remedy the situation. Encouragingly, just over half (50% of women, 56% of men) of our respondents have seen an increase in the number of female engineers working in their organisation. WISE (Women Into Science and Engineering), for instance, is campaigning to increase women's representation in jobs related to science, technology, engineering and mathematics (STEM) from the current level of 13% to a healthier-looking 30% by 2020. Many practising engineers also state that their employer is taking active steps to increase the number of women entering the profession, such as by supporting mentoring schemes in schools and universities.

**In the past five years have you seen an increase in female engineers within your organisation?**



**“The 14-17 age group needs to be focused on selling engineering as a real option – perhaps it should be rebranded as ‘applied science’ to remove the stigma of dirty, greasy engines, which do not appeal to everyone.”**

**Survey respondent**

### Methodology

Over 2,800 engineers from around the world were surveyed in late 2014 from Affiliate Members to Fellows of the Institution of Mechanical Engineers. They were asked about their careers in engineering, what attracted them to the profession, their opinions about the number of women in the sector and what can be done to improve the perception of engineering overall.





Engaging early

To bolster the chances of an increased intake of women engineers becoming a long-term trend, it's essential to engage children's curiosity as early in life as possible. Evidence suggests that an interest in science is formed by the age of 14, with students looking into pursuing STEM-related careers at this age being significantly more likely to follow their aspirations through by completing a science or engineering degree.

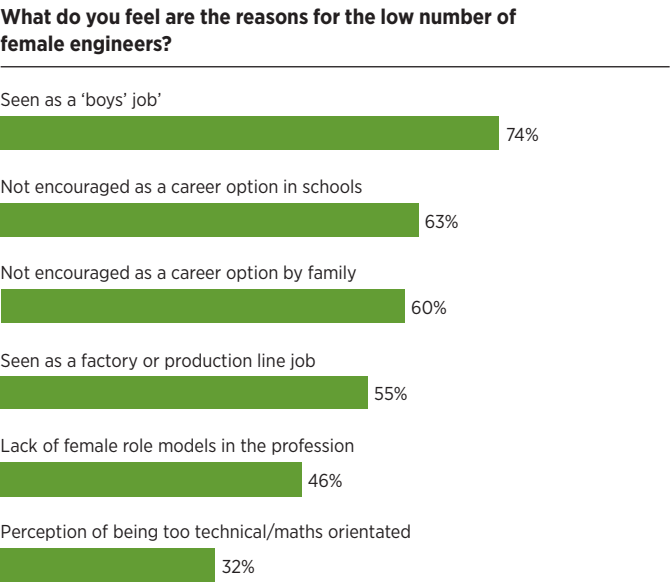
This is borne out by the views of our survey respondents. Just over two-thirds (69% of women, 67% of men) believe engineering not being presented at school as a viable career option for girls is a key reason behind the shortage of young female engineers and, correlating with this, 76% of women and 72% of men flag up its popular perception as a 'boys' job'.

Interestingly, 49% of men and 59% of women also raise questions as to whether the breadth of engineering opportunities is being adequately portrayed, with the suspicion being that it still gets pigeonholed as entailing noisy, dirty, factory or production line-based work.

Highlighting the role that attitudes within the home can also play, 60% of both male and female survey respondents mention a lack of family enthusiasm as a discouraging factor. Indeed, some back this up by pointing to positive support from relatives, who may or may not have been engineers themselves, as being instrumental in the decision making process at the outset of their careers.

“Engagement needs to be much earlier – girls in primary schools need to be taught that engineering is just clever problem solving where you are actually making a difference to the world, and nothing to do with spanners if you don’t want it to be!”

Survey respondent



Magdalena Strzeminska  
Project controls engineer  
Bechtel

**What attracted you to a career in engineering and has it lived up to your expectations so far?**  
I come from an engineering family. My granddads were engineers, and I spent lots of time with them in the garage taking things apart, which drove my curiosity. When I was deciding on my A-levels – and even earlier, when I was thinking about what would make me happy – engineering just fitted with how my brain works. It was like, “Oh my God, this makes total sense.”  
  
It's definitely lived up to expectations; there's always a new challenge. The people you get to work with are awesome – you sit with a guy who's been in the business 40 years, who tells you he used to work on submarines designing weapons launch systems, or another guy who used to commission nuclear plants. They've so much to tell you – you learn so much – and they still have such enthusiasm.

**Do you think your gender has had any bearing on your career? What has been the single biggest challenge you have faced so far?**  
I think you have to work a little harder to be taken seriously as an engineer. It's an ageing industry and some stereotypes can be still prevalent. Certain behaviours or comments might be seen as discriminating. They don't do it on purpose but you have to occasionally remind people: “I'm not a PA.” I think a shift in age balance would change things.

My biggest challenge was admitting I had to have that conversation with a senior colleague – “I'm here to work with the team, I'm an engineer. People pick up on the little nuances – I need you to treat me as you treat everyone else.” It felt a bit uncomfortable, but it improves relationships, the team dynamic and the overall performance when you do it. Get it over with and things get better.

**Do you think more can be done to promote engineering as a career choice to women? Should there be initiatives for women to stay in the profession?**  
It starts in the home – parents should be educated as well as schoolgirls. In terms of what engineering means, my teachers in secondary school couldn't really tell me. People don't realise it's so much more than manufacturing, because that's the image that's portrayed. It's about showing the whole variety of engineering, and making it positive and clear – making open days and activities available to promote understanding.

From what I've experienced, the encouragement for women to stay in the profession is positive and there are initiatives there. But it's about not making certain subjects taboo. I've had conversations like, “Don't worry about taking time to go and be a woman and do what women do” – it's amusing because I'm like, “Oh, you mean having children?” and they'll say, “Yes, but I didn't want to put it that way.”

**What would your top advice be to women considering a career in engineering and also to women who are already in the profession and want to stay?**  
Be enthusiastic. Just because it's male dominated doesn't mean it has to be scary. If you're contributing, performing and making a difference, I don't think it matters what you look like, who you are or where you come from – people will appreciate it.



“It starts in the home – parents should be educated as well as school girls.”

Attracting and retaining talent

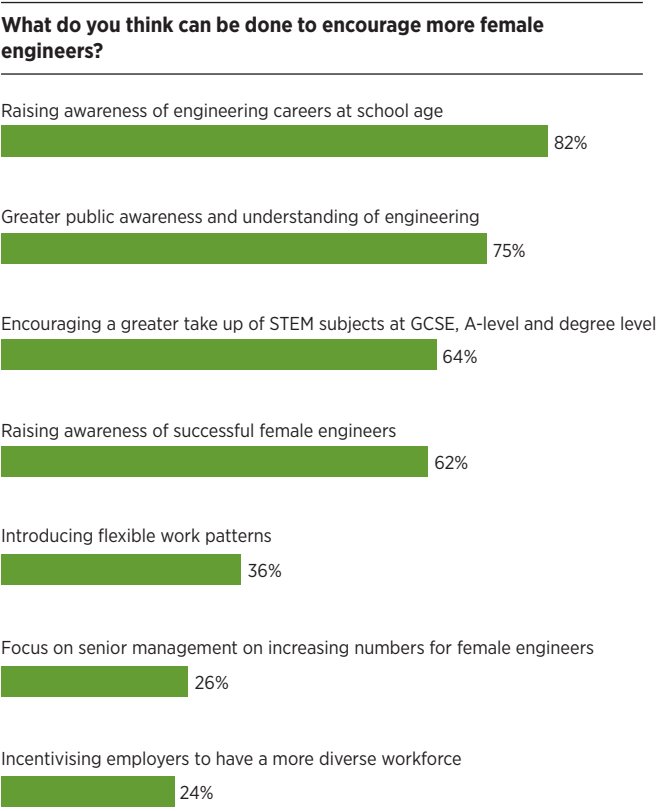
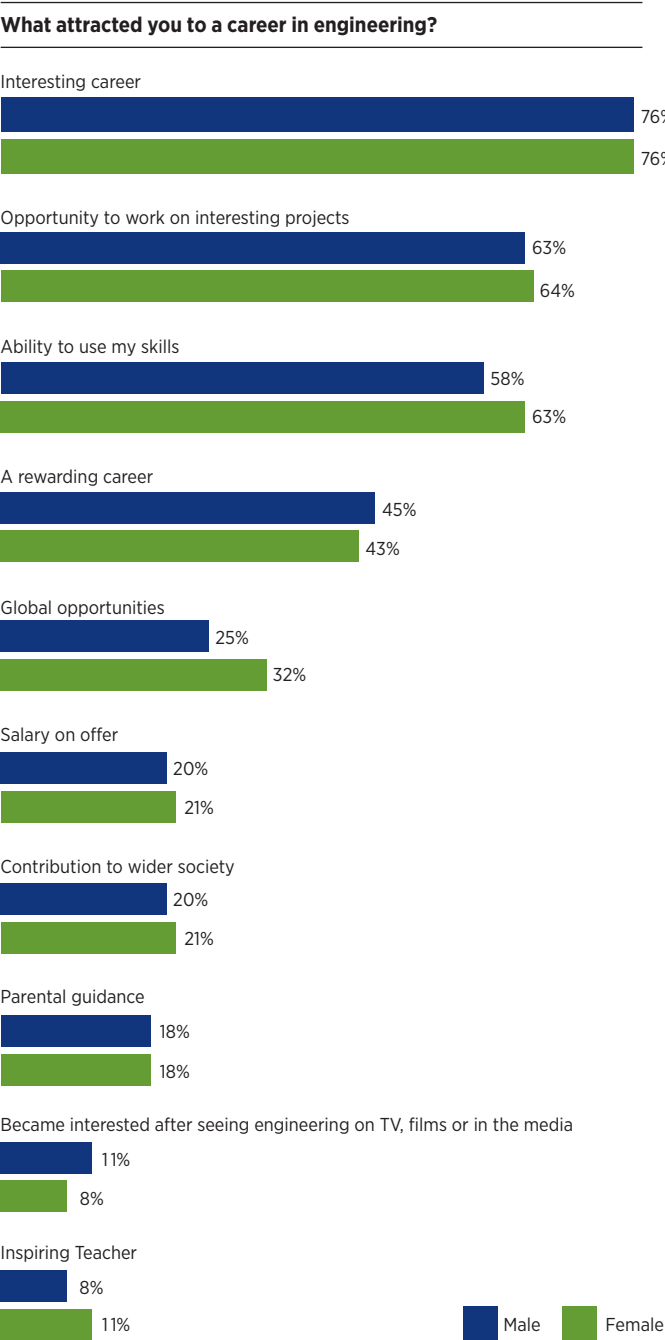
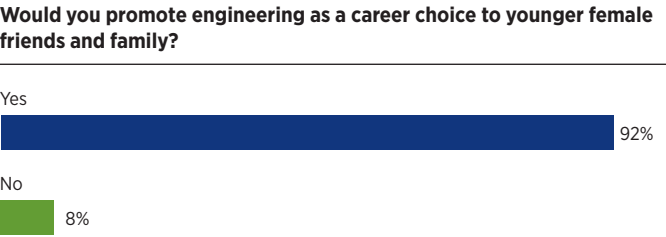
The vast majority of practising engineers – 93% of women, 91% of men – wouldn’t hesitate to recommend their profession to young female friends and family. Yet this kind of out-of-hours word of mouth on its own clearly isn’t enough to entice the necessary numbers into an engineering career.

Underlining the crucial role that switched-on teachers and careers advisors can take, more than 80% of respondents believe that increasing school-age awareness of engineering opportunities is necessary to engage the interest of more girls. Just under two-thirds (66% of women, 62% of men) also point out that finding ways to encourage a greater uptake of STEM-related subjects – on which all engineering roles are founded – is essential.

Looking beyond the educational realm, more than six in ten respondents (64% of women, 60% of men) feel that raising the profile of successful female engineers would be beneficial. Meanwhile, a greater number of women (43%) than men (28%) say that introducing more flexible working patterns would help to retain – and potentially, down the line, attract – female talent (some women report having experienced discriminatory behaviour in the wake of motherhood). We see a similar gender disparity when asked about senior managers focusing on increasing the number of female engineers within organisations – 32% of women think this has a part to play, while less than 20% of men feel likewise.

It’s apparent that there are mixed feelings among engineering professionals of both genders when it comes to firms being incentivised to create more diverse workforces. 30% of women respondents believe such initiatives can have a beneficial effect, just 18% of men agree, with many having had to overcome challenges fuelled by workplace gender imbalance. These include being the subject of inappropriate comments, and being ignored, not taken seriously or overlooked in favour of male peers, as well as simply encountering repeated situations in which men act uncomfortably because they are unaccustomed to dealing with women in a professional environment.

Yet a number of women also express unease over anything that could be perceived as positive discrimination, both because it could encourage women to be taken less seriously, and because of the potential for talented men to miss out – making the wider profession a poorer place.



“If females aren’t choosing to study engineering then there will be a lack of females for engineering companies to employ. I think encouraging school students to take STEM subjects, allowing them to understand both that engineering is an option and what an engineer actually does would give the most benefit.”

Survey respondent

Bridging the skills gap

One striking factor amongst our respondents – both male and female – is the clear desire that the engineering sector be amply populated with the brightest and best candidates, whoever they may be.

76% of men cite greater public awareness and understanding of engineering as being vital to attracting more women into the profession. This is self-evidently an aspiration that, if achieved, would also encourage more boys to consider their career options as engineers.

Asked for additional comments on the subjects addressed by the survey, many women – including those who have experienced discrimination – return to the overarching need for high-calibre engineering graduates, of both genders, in order to address the ongoing the talent shortage. They reiterate that misconceptions about the industry, fuelled by social and educational factors, mean that engineering isn’t seen by enough young people as a sufficiently prestigious, accessible – albeit challenging – outlet for their capabilities. Some also point out that enacting change means taking steps to ensure students from a much greater range of social and economic backgrounds, of both genders, are empowered to pursue STEM-related careers.

Ultimately there’s almost no discernible difference between the motivations that lead men and women into engineering. 76% of respondents of both genders say they chose it because it offered an interesting career, 63% felt it would lead to the opportunity to work on interesting projects, and around six in ten (63% of women, 58% of men) viewed it as a good outlet for their skills. If the sector as a whole is to address its ongoing talent shortage and meet projected workforce demand over the next decade and beyond, it must find ways to stimulate and nurture this kind of curiosity in a far wider cross-section of young people, from school age and at every level upwards. Continuing to improve links with educational establishments to promote better awareness of engineering, both among teaching and careers professionals and among parents, seems certain to be a vital part of this process.

## Conclusion

The engineering sector is beginning to take positive steps to address the proportional imbalance of young women entering the profession. Nonetheless, it remains a particularly concerning factor contributing to the ongoing industry-wide skills deficit.

The reasons behind the problem may seem simple, even predictable, but that doesn't mean they are easy to fix. The perception of engineering as a 'boys' job' is perpetuated by the current low intake of women into roles, in turn feeding into an entrenched lack of encouragement by teachers, careers advisors and family members.

Change will only occur if this can be addressed from early childhood, the time when an interest in science is most likely to develop, and onwards. The key to this is fostering a much broader and deeper understanding of the many different forms an engineering career can take, combined with a push to encourage greater take-up of STEM-related subjects at GCSE and A-Level and at university.

Industry partnerships with educational providers, including hands-on work with students, will have an important role to play. But employers must also consider their own practices, for instance around flexible working, and how these can help attract and retain talented female engineers who have moved beyond the education system. Senior managers, many of whom may have spent their working lives working in male-dominated environments, should give thought to how they might go about increasing the numbers of women on their organisations' payrolls.

It's crucial, though, that the lack of female engineers continues to be considered as one facet of a larger challenge – sustaining the overall workforce. Many of the aspirations around awareness-raising and promoting the benefits of STEM-related careers apply not just to attracting women into the industry, but to ensuring that in future, the greatest possible number of young people from all backgrounds have the chance to get their enthusiasm fired by what engineering has to offer.

“I think the main question is, ‘Are there barriers to girls and women who want to become engineers fulfilling that goal?’ There will probably always be something of a gender imbalance, so the best way is to focus on individuals. Many engineering companies and environments have a rather masculine culture, which can be off-putting.”

Survey respondent

## Recommendations

Given the worrying prediction of a 35,000-strong shortfall in engineers in the UK per year over the next decade, we all need to do our bit to drive the uptake in engineering-related subjects. There is overwhelming feedback that talented young women and indeed talented young people generally, need to be targeted early in schools in order to educate them about the challenging, rewarding engineering careers that can open up in front of them if they pursue STEM subjects.

People who currently work as engineers tend to have a very positive perception of their profession and are highly supportive of their industry. Most of them would recommend it to young people who are considering their career options. Yet this report highlights a number of troubling issues – apparent from the perspectives of both men and women who participated in it – that indicate not enough is being done to attract women into engineering.

We hope that this report has adequately spelled out the need to address the imbalance in the ratio of male and female engineers. However, given the global shortage of skilled engineers in general, employers should continue to put opportunities to develop talent – in all its shapes and forms – at the top of their agendas. In doing so, their priorities will be better aligned with those of many of the professionals who contributed to our study.

### Refresh the image

A high percentage of people we surveyed don't believe that the breadth of engineering careers available is being adequately portrayed to young women. Engineering isn't viewed by potential recruits as a sufficiently prestigious or accessible industry to hold their attention. Compounding the problem is the archaic, yet dangerously enduring idea that engineering is a 'boys club' in which people work in noisy shop floor environments. This needs to be continually tackled – starting at school-age level. Potentially, rebranding the subject could be one way to engage with not only women but young people as a whole.

### Change the culture

Companies with a high percentage of male engineers, especially if their workforce is predominantly made up of people approaching the end of their careers, may want to consider whether their overall corporate culture is as attractive as it could be to women recruits. Introducing more flexible working patterns may be one potential step towards attracting and retaining female talent in the future. Firms investing in apprenticeship training could also increase their appeal to young women looking at engineering roles to develop a culture that supports an equal workforce.

### Educate young people

The need to modify young people's preconceptions that engineering is about working with dirty machines, is something that can't be stated too often. Organisations should look to offer training opportunities and working schemes so that newly qualified engineers are given the chance to develop their theoretical skills. Engineering employers should partner with schools and educational facilities and aim to engage young people within the 14–17 age range, educating them on the many different types of engineering roles available and future career paths.



### Sarah Templey

Chief Mechanical Engineer  
Amec Foster Wheeler

### What attracted you to a career in engineering and has it lived up to your expectations?

At school I enjoyed maths and physics but wanted to do something more applied. I like solving problems and seeing things being created as a result of work I've been involved with. Also, my careers advisor couldn't get their head around the fact I wasn't going to be a teacher – and said, “Don't do engineering, you'll get your hands dirty”... but that sounded like the most fun thing I could be doing.

Overall it's lived up to expectations. I don't get to do much maths nowadays, but I do get to solve problems (some business, some technical). I still find it an exciting career, with lots of variety.

### Do you think your gender has had any bearing on your career? What has been the single biggest challenge you have faced so far?

I don't think it's held me back, but there's sometimes been a need to demonstrate I'm an engineer to people when I first meet them, to stop them assuming I'm a tech clerk or in a non-technical function.

But being a woman you're automatically more visible, so get noticed – including for good stuff. Talking to fellow students as an undergraduate, some men had gone into engineering as an expectation whereas it's a positive choice for a woman – so sometimes maybe there's also more enthusiasm. The most common difficulty has been finding personal protective equipment, such as site boots, in the right size.

### What has been the biggest highlight in your career so far?

Many of them have been around people as much as technical and project delivery. When the first engineer I was mentoring gained his CEng, it was good to feel I'd supported a colleague through a step in their professional development. I get a buzz out of that.

On the engineering front, it was being in a fabrication yard in Fife and watching my first jacket (the legs an oil platform stands on) being loaded onto a barge ready for installation. Seeing all that steelwork slowly move from a snowy quayside is a memory that's lingered.

### Do you think more can be done to promote engineering as a career choice to women? Should there be initiatives for women to stay in the profession?

There are opportunities to do more to support teachers and parents, to help them understand what engineering careers can be from apprentices through to degree-qualified engineers.

Industry retention could be improved by focusing on what support women returning from career breaks need. In a science-engineering environment you use lots of computer tools, and if you take a break you'll return to a different toolkit. How do you get your skills up to speed? On the academic research side there are charities like the Daphne Jackson Trust, but I'm not aware of an equivalent supporting people returning to careers from an engineering perspective.

### What would your top advice be to women considering a career in engineering and also to women who are already in the profession and want to stay?

Find a sponsor and a mentor, develop your network and don't be afraid to ask for opportunities that suit your career aspirations. Also, research has shown that success is achieved through three factors – performance (10%), 'personal brand' (30%) and exposure (60%) – but often women focus on just the performance aspect.

Engineering at all levels is a rewarding career, and even within one discipline there are many possible career paths – don't be put off by the hard-hat image. It's a good career choice if you want to do something that will have an impact upon society.

“Engineering at all levels is a rewarding career, and even within one discipline there are many possible career paths.”



amec  
foster  
wheeler





## About Hays Engineering

As recruiting experts we make it our business to understand your world of work. That's because recruitment is our lifeblood and naturally this runs through everything we think, say and do.

Our consultants are dedicated to specific industry sectors and professions. They combine local knowledge with an unrivalled understanding of your particular sector to offer a truly expert and bespoke service.

We go beyond mere skills and experience and consider cultural fit, carrying out an in-depth assessment of each candidate. Talk to any one of our specialists and you'll discover a firm belief that the right person in the right job can transform an organisation. In a world where engineers are hard to find, we provide access to a recruitment partner who knows where to find the experts you need when you need them.

We recruit across:

- Aeronautical
- Automotive
- Chemical & Petrochemical
- Civil
- Defence
- Electrical
- Highways & Transport
- Manufacturing
- Marine
- Nuclear
- Power Generation
- Renewables
- Structural
- Transmission & Distribution
- Utilities
- Water

## About the Institution of Mechanical Engineers

The Institution of Mechanical Engineers (IMechE) is one of the fastest growing professional engineering institutions. It has over 110,000 members in more than 140 countries, working at the heart of the most important and dynamic industries.

With a 160-year heritage behind it, today Institution is a forward-looking campaigning organisation. By working with leading companies, universities and think tanks, we create and share knowledge to provide government, businesses and the public with fresh thinking and authoritative guidance on all aspects of mechanical engineering.

The Institution is committed to inspiring the next generation of engineers. We go to great lengths to promote the profession at grass roots level, engaging with the next generation of engineers to build a brighter future for us all. We undertake a variety of initiatives to promote diversity and encourage women in the profession.

“The problem is that not enough talented people are attracted to engineering, as its public perception is not correct. Better education and awareness of the opportunities from a young age, I believe, will encourage more females into the profession.”

**Survey respondent**

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