

# CaSE written evidence submitted to the House of Commons Science and Technology Committee inquiry on diversity in STEM

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## About CaSE

The Campaign for Science and Engineering (CaSE) is the UK's leading independent advocate for science and engineering. Our mission is to ensure that the UK has the skills, funding and policies to enable science and engineering thrive. We represent over 115 scientific organisations including businesses, universities, professional bodies, and research charities as well as individual scientists and engineers. Collectively our [members](#) employ over 336,000 people in the UK, and our industry and charity members invest over £32bn a year globally in R&D. We are funded entirely by our members and receive no funding from government.

## Inspiring Innovation through careers provision

Creating a truly inclusive and diverse science and engineering workforce in the long-term comes from empowering all children to believe that they can become a scientist or engineer. Schools play a crucial role in providing a rounded and real scientific experience for children but formal education is not the only environment influencing young people's decisions of what they would like their future to hold. Children at the age of 7 are already forming opinions on their careers based on factors including race, gender and socio-economic status<sup>1</sup>.

While there is no silver bullet in attracting more young people to a career in research and innovation, the provision of high-quality careers advice can give school students an understanding of how they start a career in science or engineering. Providing clear guidance for pupils and linking learning to real-world examples of science and research can also help to counter disadvantages some pupils might experience outside of the classroom.

In 2021, CaSE produced a report called [Inspiring Innovation](#), which looked at the many factors affecting science education in schools. Across the UK, and between schools, there are inequalities that can significantly affect children's experience of and access to high-quality science education. Inequalities often exist from lack of experience and information.

- Students from disadvantaged backgrounds are less likely to have family science connections, for example people they know in science-related jobs or parents who are interested in science. 29% of students from the least deprived areas have family science connections, compared to 16% of students from the most deprived areas<sup>2</sup>.
- Parental knowledge of STEM and STEM-related careers is vital to increasing students 'science capital', but is low for those from under-represented backgrounds. 42% of students in years 7-13 with no family science connections are interested in a STEM career, compared to 68% of students with many family science connections<sup>3</sup>.

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<sup>1</sup> <https://www.oecd.org/education/Envisioning-the-future-of-education-and-jobs.pdf>

<sup>2</sup> <https://wellcome.org/reports/science-education-tracker-2019>

<sup>3</sup> <https://wellcome.org/reports/science-education-tracker-2019>

- Students' access to informal learning, via visits to science museums etc, was 38% for students with non-graduate parents vs 54% for students with graduate parents<sup>4</sup>.
- Initial research has suggested much science outreach funding is not specifically targeting underrepresented audiences, with a large proportion directed towards schools, and only around 5% of total spending by organisations on research to understand 'what works'<sup>5</sup>. The ease of access to information can have a significant impact on student's decisions.
- Engineering UK showed 82% of young people aged 11 to 19 who said they knew quite a lot or a lot about engineering would consider a career in the sector, compared to just 40% of 11 to 19 year olds who reported not knowing a lot about engineering<sup>6</sup>.
- Research from ASPIRES 2 shows that in England, careers provision is 'patterned' around social inequalities and students who are most in need are less likely to receive careers education<sup>7</sup>.

### Careers advice can be a gateway to opportunity

The perception that science is only for the most academically gifted children can often be perpetuated by careers guidance that is often very focused on university routes. Alongside providing links between classroom science and the world around them, a robust and comprehensive careers guidance system is crucial in attracting more students to consider a future in science or engineering. Being able to articulate the number of pathways to science and engineering, for example through T-levels, apprenticeships, BTECs and other qualifications can help in showing young people they do not have to go to university to become a scientist, engineer or technician. Robust careers guidance is not the only factor in creating a more inclusive culture for science in schools, but enhancement of resources available to careers leaders in schools can help to show the sheer diversity of careers within science and engineering.

Research by EngineeringUK and partners, including CaSE, highlighted some of the positive developments that are the result of the previous careers strategy.<sup>8</sup> The report, for example, drew attention to the importance of the careers hubs in enabling young people to gain access to STEM employers. However, the research also showed that there is still some way to go with regards to careers provision in schools and colleges, making the case for a clear framework to guide the education sector as well as drive investment.

### Difficulties caused by the Covid-19 pandemic

'Securing the future: STEM Careers provision in schools and colleges in England',<sup>9</sup> a joint report by EngineeringUK and 7 engineering and careers organisations published in June 2021 argues that while STEM careers provision is essential to inform and inspire young people irrespective of their gender, ethnicity, socio-economic background or other characteristics about careers in STEM, Covid-19 has made delivering that careers provision in schools and colleges more difficult.

Just over three quarters (76%) of the careers leaders and STEM teachers surveyed for the report say that it has become more difficult to engage with employers since the start of the pandemic, with

<sup>4</sup> Kantar Public. Young people's views on science education. 2017

<sup>5</sup> Wellcome Trust, BEIS, National Coordinating Centre for Public Engagement. Mapping Funding for Public Engagement with STEM at a System Level. 2016

<sup>6</sup> <https://www.engineeringuk.com/media/232356/our-careers-our-future.pdf>

<sup>7</sup> <https://www.kcl.ac.uk/ecs/research/aspires/aspires-2-project-spotlight---year-11-students-views-on-careers-education-and-work-experience.pdf>

<sup>8</sup> [https://www.engineeringuk.com/media/274342/euk2535\\_careers\\_provision\\_report\\_lr.pdf](https://www.engineeringuk.com/media/274342/euk2535_careers_provision_report_lr.pdf)

<sup>9</sup> [https://www.engineeringuk.com/media/274342/euk2535\\_careers\\_provision\\_report\\_lr.pdf](https://www.engineeringuk.com/media/274342/euk2535_careers_provision_report_lr.pdf)

many saying that careers activities have been put on hold because of time pressures. The report also found that the digital divide affects access to STEM careers activities in schools and colleges in England, particularly in schools with an intake of poorer students. 68% of schools with above average Free School Meal eligibility (FSM) said a lack of access to technology and internet was a barrier, compared to 36% of schools with below average FSM. Respondents also highlighted real issues around funding and capacity, with 46% quoting the former and 70% the latter.

### Recommendations for action

The Government's Careers Strategy published in 2017, concluded in 2020, leaving a strategic blackhole at a time when there are increasing pressures on education settings to ensure that young people leaving school or college are knowledgeable and work ready. The UK Government should seek to build on the 'Skills for Jobs' white paper published in 2020 to develop and implement a careers strategy in England that can deliver high-quality careers guidance. The strategy should build upon the previous strategy and Gatsby benchmarks to provide comprehensive STEM careers provision to all schools and colleges. In order to support this implementation, careers hubs should be expanded to cover all secondary schools, as a minimum, and each careers hub to employ a dedicated STEM leader.

Investment will be required to deliver on this. We have joined with EngineeringUK to call for additional funding in the region of £40 million annually to support careers activities in schools in England. This funding would provide an average of £8,000 per secondary school or college for careers activities, £3.5 million to employ STEM leaders in each career hub and provide £10 million to invest in a 'STEM Diversity Fund' to address some of the additional challenges facing schools with more young people from groups who are under-represented in the STEM workforce<sup>10</sup>.

### Data on Diversity

In our 2018 Diversity Policy Review<sup>11</sup> we recommended that UKRI should embed diversity monitoring and publish data about the diversity of studentships and fellowships across all the research councils and Innovate UK. Data collection and analysis can support the correct diagnosis of issues, prioritising interventions and development of policies and programmes.

UKRI has since published data from across all research councils looking at various protected characteristics across applicants and awardees for UKRI funding<sup>12</sup>. This is a very welcome first step, and it will be important that this data is comprehensively monitored to begin to understand where disadvantages are caused by the current funding system and steps could be made to address such issues.

UKRI has also undertaken two reviews on equality, diversity and inclusion and did find that data collection practices vary widely which can hamper robust analysis<sup>13</sup>. UKRI has taken steps to collect and publish data, but this effort can only lead to success in reducing inequalities by acting on the findings from data collection. As robust data continues to be collected and more widely understood,

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<sup>10</sup> [https://www.engineeringuk.com/media/274342/euk2535\\_careers\\_provision\\_report\\_lr.pdf](https://www.engineeringuk.com/media/274342/euk2535_careers_provision_report_lr.pdf)

<sup>11</sup> <https://www.sciencecampaign.org.uk/resource/diversity2018.html>

<sup>12</sup> <https://www.ukri.org/our-work/supporting-healthy-research-and-innovation-culture/equality-diversity-and-inclusion/diversity-data/>

<sup>13</sup> <https://www.ukri.org/our-work/supporting-healthy-research-and-innovation-culture/equality-diversity-and-inclusion/evidence-base/>

it should lead the research and innovation community to implement ways to support those from all backgrounds to feel supported within their career.