Joint response - STEM careers collaboration
Education Committee Inquiry on CEIAG

1. About this joint response

In June 2021 a collective of eight leading bodies in the fields of STEM and careers education, information, advice and guidance published a joint report – **Securing the future: STEM careers provision in schools and colleges**[1]. The report was informed by a survey of around 200 teachers and careers leaders in secondary schools and colleges in England, as well as relevant literature and evidence. We are pleased to be able to come together again to submit a joint response to this important inquiry.

The organisations in support of this written evidence submission are: Careers England, Campaign for Science and Engineering, Careers Development Institute, EngineeringUK, Institution of Civil Engineers, The Institution of Engineering and Technology, Institution of Mechanical Engineers and The Royal Academy of Engineering. The submission also has the support of the Engineering Professors' Council.

2. Policy recommendations

1. We ask the government to urgently publish **a new careers strategy** for England.
2. We ask that **careers hubs** are rapidly expanded to cover all secondary schools in England.
3. We recommend that there is a **dedicated STEM leader** within each careers hub.
4. We recommend that government provide additional funding of at least **£40 million annually** to support careers activities in schools.
    - around £30 million annually to ensure that schools are better resourced to support all young people with their careers choices.
    - £3.5 million annually to pay for STEM leaders in careers hubs.
    - £10 million annually for a 'STEM Diversity Fund'.
5. We ask that the government urgently develops a fully funded **digital learning strategy** for schools.
6. We ask that the government **embeds careers** into the subject content of **the STEM curriculum** and ensures that it highlights the diverse range of roles and people in science and engineering.
7. We ask that **teacher training and continuous professional development** includes information and training on STEM careers, including careers in modern engineering.

3. Why STEM careers provision matters

The UK has an ongoing shortage of engineers[2] and with the government's drive to 'build, back, better' through infrastructure, innovation and green technologies the demand for engineering skills is only likely to increase. Take climate change - the UK needs a diverse and thriving engineering workforce right at the forefront of ground-breaking green solutions in the fight against global warming - from carbon capture to green transport, renewable energy to sustainable food. Similarly, the UK's ambitions in relation to research & development, confirmed by the recent commitment to spend £39.8bn on R&D for 2022-

[1] EngineeringUK & partners. 'Securing the Future: STEM careers provision in schools and colleges in England', 2021. https://www.engineeringuk.com/research/briefings/securing-the-future-stem-careers-provision-in-schools-and-colleges-in-england/
[2] EngineeringUK. 'Educational Pathways into Engineering', 2020. https://www.engineeringuk.com/media/196594/engineering-uk-report-2020.pdf

2025[3], will require not only upskilling the existing workforce but also ensuring that enough young people are equipped with the skills needed to work in sectors driving innovation.
Alongside the economic case, there is a social imperative too. Engineering can unlock opportunities for young people to work in good quality, well-paid, stimulating jobs, using their skills and passions to make a difference. Improving the overall knowledge of engineering, the career and salary expectations that can be achieved and showcasing the breadth of roles available in the engineering sector, are key to attracting more, and a more diverse group of young people into engineering careers. If the government wants to level up career pathways for young people and widen job opportunities in fields such as net zero, digital and health-tech, it is essential that all young people receive high quality STEM careers support, informing them of the full breadth of vocational and academic pathways into science and engineering and inspiring them to want to seek a career in those sectors. Careers provision can act as a great leveller for many young people, who otherwise would not be able, or know how, to access the information that supports them with deciding what career path is right for them, as a recent UCAS report highlights[4].

Research conducted by EngineeringUK clearly shows that young people who know more about what engineers do are more likely to perceive the profession in a positive way and to consider a career in engineering[5]. The research also shows that STEM outreach and education activities is linked to careers aspiration. Pupils who had attended any (one or more) STEM careers activity, were 3.5 times more likely than those who hadn't attended any to know about what people working in engineering did. They were also 3.4 times more likely than those who hadn't attended a STEM careers activity, to consider a career in engineering[6].

4. Key findings from our 'Securing the future' report

Careers leaders and school staff working on careers provision in English secondary schools and colleges which took part in our research reported experiencing various challenges with delivering comprehensive careers provision to young people. **70%** of respondents said that **lack of staff time** was a barrier to delivering STEM careers provision and **46%** of respondents said that '**lack of funding** for STEM careers provision' affected their school's ability to deliver STEM careers provision. When asked how, if at all, the Covid-19 pandemic has caused challenges for careers provision at their school, **91%** of respondents said, 'lack of opportunity to organise in-person visits' and **86%** selected 'lack of opportunities to organise work experience'. A further **76%** told us that it had become 'more difficult to engage with employers' and **49%** of respondents said that pupils not being able to access online or virtual careers provision due to lack of technology or internet at home was a barrier.

Our research also found that while **90%** of survey respondents said their pupils have at least one employer encounter every year, only **71%** said the same when asked about STEM employers, and **64%** when asked about engineering employers. Similarly, **55%** of respondents said their pupils had an experience of a workplace with any employer compared to just **33%** with STEM employers and **30%** with engineering employers. Based on our survey findings, the main barriers relating to engaging with more STEM employers were: 'Not enough capacity within my school' **(44%)** and 'not enough funding allocated to careers programmes' **(34%).**

Diversity and Inclusion

It is more important than ever that the engineering sector is able to attract a diverse range of young people into the profession. Yet most recent data suggest this still presents a huge challenge with for

[4] UCAS. 'Where next? What influences the choices school leavers make', 2021
[5] EngineeringUK 'Engineering Brand Monitor', 2020 https://www.engineeringuk.com/research/engineering-brand-monitor/
[6] ibid

example only 16.5% of engineering roles currently undertaken by women[7], just 24% of those working in engineering coming from lower socio-economic backgrounds[8] and only 10% of those in engineering occupations being of minority ethnic heritage compared with 13% of the total labour force.

Our Securing the future report highlighted a variety of barriers[9] to accessing STEM careers provision in schools for young people from groups currently underrepresented in STEM sectors:

- **Lack of awareness of STEM careers provision available** - It was clear that respondents also felt more could be done to promote STEM careers provision to diverse groups, with a lack of awareness of what was available featuring in the top five reported barriers to the participation of pupils with SEND (38%), from lower socioeconomic backgrounds (37%), or minority ethnic backgrounds (30%).
- **Role models** - The most frequently cited barrier for girls (at 46% of respondents) and pupils from minority ethnic backgrounds (38%) is the lack of visible role models. 38% of respondents also reported a lack of role models to be a barrier for pupils with special educational needs and disabilities (SEND) and a third said the same for pupils from lower socioeconomic backgrounds.
- **Understanding of STEM careers** - A limited understanding of what STEM careers could entail ranked in the top 5 barriers for all groups, with more than two in five respondents perceiving this to be the case for pupils from lower socioeconomic backgrounds (45%) or with SEND (44%) and just over a third for girls or boys from minority ethnic backgrounds (34% respectively).
- **Confidence and encouragement** - A lack of confidence in their abilities to pursue relevant pathways into STEM careers was commonly cited by respondents as a barrier to participation in STEM careers provision for certain groups. Almost half of all respondents (48%) said that this was the case for young people with SEND, 46% said this in relation to young people from lower socio-economic backgrounds and 39% about girls.
- **Unique barriers** - Although a number of barriers were felt to be challenges to the participation of girls, pupils with SEND, or those from lower socioeconomic or minority ethnic backgrounds alike, respondents also identified particular challenges for certain groups. For example, 39% reported the perceived cost of pursuing pathways into STEM careers to be a barrier for pupils from lower socioeconomic backgrounds taking up related careers provision opportunities, and a similar proportion noted perceived difficulties in physical accessibility of STEM careers to be a barrier for those with SEND (38%).

These barriers need to be addressed to ensure that the UK has the talent pool to rise to the challenges and take advantage of the opportunities that the fourth industrial revolution and the ambition to achieve net zero by 2050 will bring. The recommendations below aim to bring us a step closer to opening up STEM, and engineering careers specifically, to a more diverse group of young people. They look to support the development of a whole school/ whole college approach to careers provision that will ensure that teachers and careers leaders are able to complement the work of impartial and professional careers advisers – who should be available to all schools and colleges – and will enable young people to experience and get inspired by the world of work.

Recommendations

1. We ask the government to urgently publish a new careers strategy for England.

The government's previous careers strategy (and associated action plan) came to an end in 2020. The Skills for Jobs white paper offers only limited insights into what the government wants to do next to

[7] EngineeringUK, 'Trends in women in engineering, February 2022 - https://www.engineeringuk.com/media/318037/women-in-engineering-report-summary-engineeringuk-march-2022.pdf

[8] https://www.engineeringuk.com/media/1762/social-mobility-in-engineering.pdf

[9] All findings are taken from EngineeringUK, Securing the future: STEM careers provision in schools and colleges in England, 2021

support careers provision in schools and colleges. It contains no information about the funding that will be made available for careers provision in schools, nor does it provide any timelines for delivery and there is no detail about STEM specific careers provision and the government's plans to improve this across all secondary education. We believe that an **ambitious new careers strategy that builds on the previous strategy, the Gatsby benchmarks and links in with the new DfE climate change and sustainability strategy is urgently needed** to help address the gaps in time and funding issues faced by many schools when delivering STEM careers support and ensure a joined-up approach across government strategies. For example, a new careers strategy could incorporate more recent policy developments such as the introduction of Local Skills Improvement Plans. These provide an opportunity to help embed a place-based approach to CEIAG – ensuring careers provision is shaped to help better reflect local labour market and community needs. With a commitment to a **Future Skills Unit**, as outlined in the levelling up white paper – a new careers strategy could help to ensure workforce planning and careers policy is delivered in an integrated way across government. Supporting greater connectivity between careers delivery and changing workforce skills needs was also highlighted by the House of Lords Youth Unemployment Committee[10].

2. We ask that careers hubs are rapidly expanded to cover all secondary schools in England.

In its Skills for Jobs white paper the government outlined its commitment to continue with rolling out careers hubs in England. This has been welcome news as our research and that of others has shown that careers hubs can make a real difference in how schools and colleges engage with careers provision. Our own survey has revealed that schools that are currently in a careers hub are more likely to engage with employers and programmes such as the STEM Ambassadors programme. However, **the white paper is much less clear on the timelines and the extent to which it hopes to expand the network and how it is funded,** and this is why we are calling on the government to provide a clear timeline – including the rapid rollout of careers hubs to all schools and colleges in England. With the introduction of LSIPs across the country, careers hubs could make a valuable contribution to skills planning at a local level (including STEM), but some areas of the country risk missing out if they do not yet have a careers hubs in their locality.

3. We recommend that there is a dedicated STEM leader within each careers hub.

Respondents from schools and colleges in careers hubs were more likely than those not in these areas to offer to their pupils at least one encounter with STEM employers every year (80% and 53% respectively). However, while this finding is encouraging, it also shows that a considerable minority of schools and colleges in careers hubs have not been able to offer STEM employer encounters. The main barriers for working with employers identified by respondents included limited capacity within their school (44%), limited funding for their careers programme (34%) and not knowing how to engage with STEM employers for careers provision (24%).

We would like to see each careers hub is given a new coordinator – a STEM leader – whose role it is to build up the capacity of schools and colleges around STEM careers and facilitate joint STEM careers activities with employers, including work experience. This would help to alleviate some of the time constraints and barriers to employer engagement highlighted in our research and help with bringing currently under-represented employers, such as engineering employers, into schools. STEM leaders would have a pivotal role in supporting strategic efforts across a careers hub to improve STEM careers provision in schools, as well as in enabling schools to engage with College Business Centres and Local Skills Improvement Plans as proposed in the Skills for Jobs white paper.

[10] House of Lords Youth Unemployment Committee. 'Skills for every young person', November 2021. https://committees.parliament.uk/publications/7988/documents/82440/default/

4. We recommend that government provide additional funding of at least £40 million annually to support careers activities in schools.

Our survey, as well as other research[11] has highlighted that careers provision in schools and colleges in England is underfunded. We see this echoed not only what respondents to our survey told us but also compared to historical funding, international comparators or to the costs required to deliver the model that is advocated by government policy. This is limiting what schools and colleges can offer to young people in a time when they need guidance, insights and inspiration more than ever.

As highlighted by Professor Tristram Hooley, spending on the delivery of careers guidance stood at over £200 million annually before 2011.[12] Furthermore, other countries in the UK, such as Scotland spend significantly more per young person for careers provision -around £160 per young person-per-year (0-24) on careers[13]. If the same approach was applied in England (under the age of 25) it would require a budget of over £2 billion[14], and at least between £56 and £87 million if only applied to pupils in state funded secondary schools[15]. Calculations by PWC in 2014 also estimated that it would cost between £173 million and £207 million to deliver the Gatsby Benchmarks in UK schools.[16]

We would therefore like to see the government investing more in careers provision in schools and colleges to ensure that young people have the knowledge to navigate the pathways into a variety of roles and careers giving them the opportunity, for example, to better understand what a career in STEM has to offer and how to get there. We recommend an investment of at least an additional £30 million annually, an average of £8k per secondary school or college, to ensure that schools are better resourced to support all young people with their careers choices. In addition to this additional general funding, we ask that the government fill the funding gap that has been identified by this report and others particularly in relation to STEM and invest an additional £3.5 million annually to pay for STEM leaders in careers hubs (see points above) and £10 million annually for a 'STEM Diversity Fund' for careers provision activities.

It is envisaged that this fund would be held by careers hubs and administered and distributed to schools by the new STEM leaders. This funding should be predominantly made available to schools with more young people from groups who are under-represented in the STEM workforce enabling them to address some of the additional challenges that such schools may face and to support the greater diversification of the STEM, and in particular, the engineering workforce. The funding would help schools broaden their offer and enable them to buy in further resources as required. We believe that this would also help address some of the patchiness in provision that our survey identified.

5. We ask that the government embeds careers into the subject content of the STEM curriculum and ensures that it highlights the diverse range of roles and people in science and engineering.

We believe that in order to ensure that all young people get the opportunity to be inspired by what a career in STEM, including engineering, can offer, STEM employers and ambassadors need to be brought into the classroom, ensuring a focus on representation from diverse groups and different careers paths.

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[11] Sutton Trust. 'Paving the way: careers guidance in secondary schools', March 2022. https://www.suttontrust.com/our-research/paving-the-way/

[12] Hooley, T., & Watts, A.G. (2011). *An analysis of current developments in careers education and guidance for young people in England*. University of Derby. https://derby.openrepository.com/handle/10545/196706

[13] Hooley, T., Percy, C., and Alexander, R. (2021). *Exploring Scotland's career ecosystem*. Skills Development Scotland. https://derby.openrepository.com/bitstream/handle/10545/626165/exploring_scotlands_career_ecosystem.pdf?sequence=1&isAllowed=y

[14] Office for National Statitistics. (2021). Estimates for the population for the UK, England and Wales, Scotland and Northern Irelands. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland

[15] In *Exploring Scotland's career ecosystem* the figure of £160 per person is offered for all young people. In reality a lot of this funding is likely to be concentrated on secondary aged children and above, leading the authors to suggest a more likely typical spend at this age as £250 per pupil.

[16] PWC. (2014). *Assessing benchmarks of good practice in school career guidance*. Gatsby Charitable Foundation. https://www.gatsby.org.uk/uploads/education/reports/pdf/pwc-assessing-benchmarks-of-good-practice-in-school-career-guidance.pdf

Our survey has highlighted the importance attributed to role models in inspiring young people from a diverse background to go into engineering and more widely into STEM careers. This will ensure that any young person, whatever their background, gender or ethnicity will be able to see what a career in STEM could look like for them, have the opportunity to be inspired and become informed about how to get there.

STEM careers provision is currently often seen as an extra-curricular activity fitted in during lunchtimes or after school where time and resources allow it. While there is work taking place to ensure that teachers are better equipped to link the STEM curriculum learning to careers[17], introducing STEM careers into the curriculum in the longer term will give subject teachers more time and therefore more opportunities to connect classroom learning to the real world of work. An anticipated curriculum review in the coming years should provide an opportunity to consider this. We think that this should be applied to the STEM curriculum from year 7 to ensure that pupils get exposure from a young age. In fact, we would ask the government to explore in their new careers strategy how primary schools could be brought into its fold.

6. We ask that the government urgently develops a fully funded digital learning strategy for schools.

Covid-19 has fundamentally changed the learning environment for the foreseeable future and is likely to have a long-term impact on how learning will be delivered. According to our report, it has also had a huge impact on the ability of schools and colleges to deliver careers provision, with just under half of the respondents highlighting issues with accessing virtual careers provision for young people due to a lack of technology available to students.

There are many things to be learned from the pandemic and it is vital that the government now strategically plans for how young people will be able to continue to access learning and careers provision going forward. As our survey and work by others such as the Sutton Trust have highlighted, the digital divide in this country and the challenges that exist in overcoming it are vast, with government policy needing to catch up and set a long-term vision. The focus of this digital learning strategy must be on closing the digital divide in the first instance to ensure that certain groups of young people are not left behind. Then it must look at how schools are supported to integrate a digital approach into their school offer, with the view that it will in the long-run also help overcome the current patchiness of STEM careers provision in schools amongst other things.

7. We ask that teacher training and continuous professional development includes information and training on STEM careers, including careers in modern engineering.

In light of the call for a STEM curriculum review we support the ambition in the Skills for Jobs white paper to equip the teaching profession to support a whole-school or college approach to careers education by building careers awareness into every stage of their professional development, from initial training to education leadership. Ensuring that teachers know how to link careers provision to teaching will enable them to link more easily the world of learning to the world of work. In order for teachers to be able to fully integrate careers into their teaching they need to be equipped and supported to bring real world-context into the classroom, and STEM subject teachers need to be knowledgeable in what a modern STEM career looks like.

Previous research by EngineeringUK[18], shows that many teachers lack confidence when answering questions from pupils about STEM careers. We also know that engineering roles are continuously evolving and changing in areas like net-zero. With this in mind, we would like all careers leaders have access to training through the Careers and Enterprise Company (CEC). We would also like to see STEM

[17] For example - https://www.stem.org.uk/cpd/ondemand/443955/linking-stem-curriculum-learning-careers
[18] EngineeringUK, 'Engineering Brand Monitor', 2020

careers play a strong part within the Early Career Framework so that all teachers, not just STEM subject teachers, can have a broad understanding of the diversity of roles within science and engineering, which in turn will help to break down stereotypes and misconceptions.

The aspirations around teacher training and CPD in the Skills for Jobs white paper provide a good springboard to make this a reality. Furthermore, it is important that all subject teachers and careers leaders regularly update their STEM careers knowledge and skills as part of the proposed plans within the Skills for Jobs white paper. Better training and support but also opportunities for 'employer encounters' for teachers and careers leaders with for example local employers can help with this, ensuring that teachers and careers leaders are up to date during times of rapidly changing labour market needs, nationally and locally.

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