

The Skills Opportunity

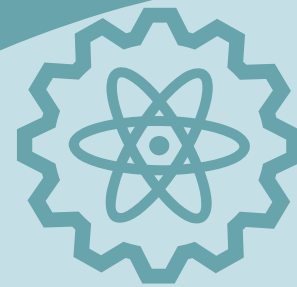
Building a more
innovative UK

A report by the
Campaign for Science
and Engineering

June 2023



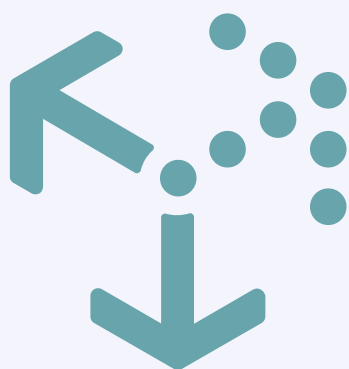
Summary of Recommendations



The ambition to make the UK a more research and innovation intensive economy has been a long-standing commitment across successive governments.

But this commitment can't be kept without an ambitious people strategy to match.

The UK Government and devolved administrations must coordinate and support an integrated skills system to deliver a more innovative and research intensive UK.



Understand skills gaps and needs

- It is necessary to better understand the supply and demand landscape of skills for science and engineering.
- Education provision needs to be better aligned with the changing skills requirements of employers and Government priorities.

Support and incentivise employers and individuals

- A range of incentives are needed to support smaller employers in the provision of workplace training, including formalising the network of intermediary support and streamlining the regulatory framework for apprenticeships.
- Increased and sustainable funding is needed to support a thriving further education sector that supports delivery of high-quality STEM training.
- Careers provision must build on progress to strengthen science and engineering guidance.



Support local talent and innovation



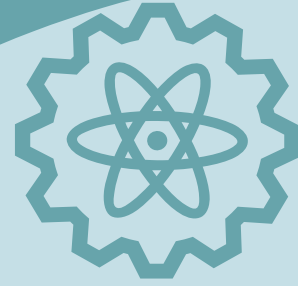
- More needs to be done to raise awareness of available R&D opportunities across the UK and better connect local people with R&D careers that exist locally or regionally.
- Local leaders should be more involved in discussions about regional opportunities and skills requirements to support the new R&D clusters.
- Making places more attractive to live will help to retain skilled people and support the regional diffusion of innovation.

Attract international talent

- The upfront cost of UK visas needs to be reduced in line with international competitors.
- There is a need for greater flexibility in the design of visas to support researcher mobility on a range of timescales.
- Applicants and smaller businesses require support to navigate the visa system.
- More needs to be done to promote the UK as an attractive destination for skilled scientists and researchers.



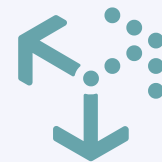
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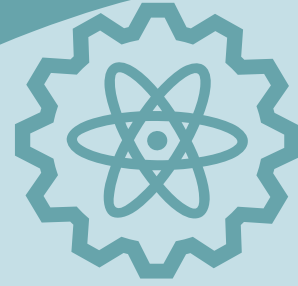


21 **Report Authors**

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Background and Context



The UK Government has recently set out an ambition to make the UK a ‘Science Superpower’. This ambition to make the UK a more research and innovation intensive economy has been shared by successive Governments who have built on the commitments of previous administrations. Political parties in both Government and opposition have also made repeated commitments to R&D investment in the UK. As part of this ambition, the UK Government has committed to increasing public research investment to £20bn by 2024/25. Alongside this, the Department for Science, Innovation and Technology have published a [Science and Technology Framework](#), which sets out how Government can achieve a step change in UK prosperity and wellbeing through science and technology. One of the ten actions in the framework relates to the skills needed to achieve the UK Government’s ambitions.

The role of education and skills

The UK’s science and engineering base is only as strong as the people who work within it. Therefore, it will be important to ensure that the uplifts to R&D spending are supported by investment in the people and skills that underpin it. Wider skills provision will be needed to meet the requirements of an expanding R&D sector, fill current skills gaps, and support skills that will be needed in the future.

There is a need to develop a greater number of people with STEM skills. The shortage of STEM skills in the UK is an ongoing problem and has been estimated to cost the UK economy £1.5bn per year (1). The UK Government has suggested that the R&D sector will need at least an additional 150,000 researchers and technicians by 2030 to sustain the UK’s ambitions for R&D (2). The Institution of Engineering and Technology (IET) has estimated a shortfall of over 173,000 workers in the STEM sector, an average of 10 unfilled roles per business in the UK (3). In addition, the IET’s Skills Survey published in 2021 identified that half (49%) of engineering businesses are experiencing difficulties in the skills available to them when trying to recruit (4).

Alongside this, the world of work is changing due to a range of factors, including technological advancements and the green agenda, amongst others, which are impacting on the types of skills that will be needed (5). Therefore, it is also important to develop new skills in the existing R&D workforce and ensure that qualifications remain relevant to changing labour market demands.

This will require a coherent approach to skills provision across different timescales. In the short to medium term, there is a need for a greater number of skilled and talented people to fill jobs in areas of current shortage and in areas of near-term expected shortage as the sector expands. This will require bringing in international talent through immigration, as well as upskilling and reskilling the existing workforce. In the longer term, the drive to become more research-intensive will require a larger pipeline of young people becoming scientists, researchers and technicians, to ensure we can meet future skills needs. Central to this is providing more opportunities to a greater number of young people, regardless of their background, showing that science and engineering can be a career for everyone across the country (6).

In addition, it will be vital to ensure that everyone can participate in and benefit from a more research and innovation intensive UK. This means equipping all young people with the skills to take advantage of advances in research and innovation. Developing a longer-term skills strategy will require developing talent at all levels, as well as through a diversity of routes, from school science, further education, higher education and continuous lifelong learning through upskilling and reskilling for future skills as they emerge.

The role of Government

To deliver on the UK Government's ambitions, it will be important to emphasise a joined-up approach to skills and across policy areas. In general, there is a lack of coherence between skills and R&D policy, with a lack of cross-Government coordination. This hampers the effective planning of education and skills development for R&D and could pose a challenge for the transition that is required. Therefore, this will require the coordination of skills policy across UK Government departments and agencies, as well as considerations for how skills policy will interact with wider policy agendas and any unintended consequences.

Skills and education policy is devolved to Wales, Scotland and Northern Ireland and there is a wide variation in skills policy across the four nations of the UK, which makes for a complex picture when looking at skills. The UK Government is responsible for skills and education policy in England only. Within England, some parts of skills policy are also devolved to Combined and Mayoral Authorities. Immigration policy is reserved to the UK Government and set for the whole UK. R&D policy is mostly reserved to the UK Government, while wider economic development policy is devolved. Therefore, there needs to be co-ordination between the devolved Governments, the UK Government and Combined and Mayoral Authorities to maximise the benefits to all areas of the UK.

The importance of equality, diversity, and inclusion

There is a growing recognition of the benefits of diversity and inclusion in helping to address STEM skills shortages (7). Attracting, developing and retaining a diverse range of talented people to pursue careers in STEM can help meet this demand and enable science and engineering to prosper. Evidence shows that there is an underrepresentation of particular groups in STEM, including women, ethnic minorities, people with disabilities and those from disadvantaged socioeconomic backgrounds. Underrepresentation is due to a range of factors. Across the UK, and between schools, there are inequalities that can significantly affect children's experience of and access to high-quality science education (6). In the workforce, employment inequalities persist, with gender inequality being particularly prominent in STEM (8).

A lack of diversity means the STEM sector is losing valuable skills, experiences and perspectives, and cannot reach its full potential without greater diversity and inclusion in the workplace (7). The UK Government's R&D People and Culture Strategy recognises the importance of diversifying and widening routes into R&D and inspiring people from all backgrounds to consider careers in science and engineering (2). Focusing on underrepresentation is important to solving skills issues, and inclusive representation within the scientific community is necessary to improve science and ultimately deliver benefits to everyone in the UK.

About this report

This report sets out some of the challenges for education and skills provision across the UK. It also sets out a number of recommendations for the UK Government to support high-quality education and skills provision in England to support a more research and innovation intensive economy. The recommendations in this report are largely directed to the UK Government and skills policy in England. However, some of the recommendations have wider applicability to the devolved administrations. The recommendations consider actions to support a rapid transition within skills provision, with a focus on barriers that could be unlocked in the short to medium term, i.e. within two to three years.

The work takes a broad look across a range of dimensions of skills provision, including science teaching in schools and STEM careers advice, through to higher and further education, lifelong learning, and immigration. A series of roundtables explored specific areas of skills provision where there are bottlenecks and pinch points that need unblocking. The work also draws together important work done by other stakeholders in the sector, to bring in perspectives on higher education and also building on CaSE's previous work on STEM education. Ultimately, the work aims to highlight the need for a holistic look at skills policy and the need for a cross-Government approach to future skills requirements in the UK.

This document has been compiled with support and guidance from leading experts in the field of R&D, and education and skills policy, who have helped to inform CaSE's policy positions. The work was supported by an Advisory Group made up of individuals with expertise in R&D, and education and skills policy.

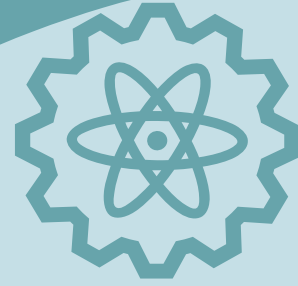
The conclusions and recommendations are based on views gathered over the last 6 months from the breadth of CaSE's membership, including businesses, universities, charities and learned and professional societies, as well as wider stakeholders. We engaged with organisations across the R&D sector and across the UK to identify challenges and solutions across the education and skills landscape. We gathered evidence using the following methods.

- Four roundtables covering the following areas of education and skills provision: Immigration system; Lifelong learning; Technical education and apprenticeships; Challenges facing Scotland.
- Interviews with universities and other stakeholders to bring in additional perspectives on higher education and devolved considerations.
- Policy workshop with CaSE members and wider R&D stakeholders to test and refine the evidence.

The conclusions and recommendations address four cross cutting themes relevant across the UK's education and skills landscape. While the work considered specific areas of education and skills provision, the conclusions aim to highlight a series of cross cutting challenges relevant across different areas of education and skills provision. In doing so, this work aims to highlight the importance of an integrated approach to education and skills provision and to ensuring policy across different areas is coordinated and aligned.



Skills Gaps



Understanding and prioritising skills gaps and needs



The UK Government currently lacks a detailed understanding of current and emerging skills gaps, and where and how skills provision can address employer demand. Our discussions revealed that there is no comprehensive mapping of the supply and demand landscape of STEM skills. There have been efforts by the UK Government to address this issue. The Unit for Future Skills within the Department for Education has been set up to improve, structure, and connect different skills data, and to improve access to the data, enabling new forms of analysis and insights on skills mismatches and demand. The Unit has been supporting the National Foundation for Education Research on a five-year research programme, The Skills Imperative 2035, to identify future skills needs and how these can be developed through the education system ([9](#)). As part of this, the Unit has also recently developed a Local Skills Dashboard showing data on local skills, education and employment in England ([10](#)). It will be important to leverage these initiatives to improve understanding of supply and demand of STEM skills. In addition, it will be important to ensure that central and local government work together to improve coordination between local and national priorities for skills and R&D. The new Department for Science, Innovation and Technology will have an important role to play in co-ordinating this work across the UK Government. The National Science and Technology Council, chaired by the Prime Minister, will need to ensure it provides leadership to get things done.

Related to this, the provision of skills is not always aligned with employer needs or Government priorities. Our discussions highlighted that the provision of skills training in universities, for instance, tends to be market-driven, i.e. driven by student preference rather than employer demand. While employers may be the end user, they do not necessarily have a lot of input into skills provision. In contrast, while students drive demand for courses, they are not necessarily aware of skills gaps and priorities. Universities are working with employers to identify, anticipate and address local and national skills gaps, as well as developing new types of provision to support lifelong and flexible learning (11). It will be important to prioritise sectors of science and technology to ensure that there is a long-term market for people to invest in STEM skills.

Recommendations



Improve the monitoring of skills demand and gaps to support changing and future skills.

Governments across all four nations should map skills demand across sectors to better understand gaps and provision needs. As skills needs vary by region and skills policy is devolved, Governments across the UK should co-ordinate and share data to provide a full picture of UK wide skills supply and demand. The UK Government should strengthen the Unit for Future Skills to embed data about skills gaps and needs through data collection and analysis. By improving, structuring, and connecting different skills data the unit can enable new forms of analysis and insights on skills needs.

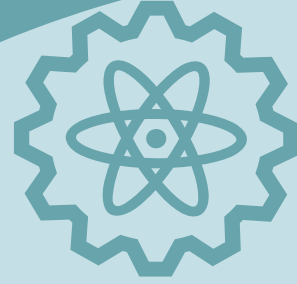


Ensure that education provision is better aligned with the changing skills requirements of employers.

The UK and devolved Governments should explore mechanisms for creating demand for future skills training that is aligned with changing employer needs and Government priorities. Sponsorships from businesses to provide training or partnerships between industry and education providers to provide joint curricula could help to bring in employer input.



Support for Employers



Providing broader incentives and support for employers and individuals



Incentives and support for employers

There is a need to develop broader incentives for employers to provide training opportunities at work, including for reskilling and upskilling as well as engaging with apprenticeship programmes. During our discussions, it was highlighted that there is a perceived decline in investment in people and skills by businesses as individual companies do not necessarily recoup the investment in people. In recent years there has been a decline in the uptake of apprenticeships in STEM areas, including engineering, manufacturing and technology ([12](#)).

The UK Government's 2021 white paper Skills for Jobs: Lifelong Learning for Opportunity and Growth proposes measures to support the delivery of skills in England to fill current and future skills gaps through lifelong learning, as well as raise the esteem of further and technical education ([13](#)). The measures aim to provide flexibility for adults who need to retrain and upskill throughout their working lives. Proposals on lifelong learning are under the framework of the Lifetime Skills Guarantee. An important component of this is the Lifelong Loan Entitlement, which will provide individuals with a loan entitlement to the equivalent of four years' worth of post-18 education to use over their lifetime. The Apprenticeship Levy was introduced in April 2017 with the aim of increasing firms' investment in training, and various apprenticeships initiatives were announced as part of the Skills for Jobs white paper. Each of the devolved regions has developed its own skills strategy, with Skills for a 10x Economy in Northern Ireland, Plan for Employability and Skills in Wales and the Future Skills Action Plan in Scotland.

While there is interest among employers to provide opportunities for training at work or take on apprentices, our discussions revealed that employers often lack the resources and broader incentives to support employees to take part in training at work.

There is a perceived risk to return on investment for businesses who invest in training employees. This is often the case with apprenticeships as businesses fear that they will not necessarily recoup the investment in people, particularly if the apprentice moves on to a new employer in the short to medium term. It was felt that this may be driven in part by smaller employers, who may find it more challenging compared to larger companies. It would therefore be helpful to explore incentives to support smaller employers to take on an apprentice.

Some employers, particularly smaller ones, are concerned about the administrative burden associated with apprenticeships and investing in staff skills. Smaller organisations lack the time, resources and expertise to navigate the system of support for apprenticeships and staff training. Regulatory aspects of apprenticeships can be inefficient and burdensome, with a number of different regulatory bodies often involved. For example, for degree apprenticeships there are currently five external regulators, and education providers must make inspections and provide returns to all of these, which can be inefficient. The amount of paperwork and administration required is particularly challenging for smaller employers, who often lack the resources of larger organisations. It was stressed in our discussions that there is a need to reduce the complexity of the regulatory framework for apprenticeships. Intermediary organisations, which assist in the provision, coordination and support of an apprenticeship, could be better leveraged to ensure smaller businesses are able to access high-quality support (14).

Regulators face significant administrative burden around keeping apprenticeship standards up to date. Many apprenticeship standards are narrow and as a result there are over 600 standards. Future-proofing and updating these can be inefficient, particularly for apprenticeships with very low numbers of apprentices (e.g. under 5 or 10). Our discussions noted that it would be helpful to develop broader standards that cover the breadth of an occupation rather than the individual job roles that make up the occupation.

The provision of formal learning and existing qualification systems do not always meet the needs of fast-moving and emerging areas of R&D, which instead rely on experience built up over time. Whereas employers often refer to skills, providers refer to qualifications, and these are not necessarily aligned with each other. Upskilling and reskilling are often intended to support fast-moving R&D and emerging areas of business need, and the provision of qualifications could be helpful in providing some standardisation of skills requirements. It is important for all types of learning (both formal and informal) to be recognised and validated in a way that employers can value. This needs to be recognised when thinking about how to better leverage local skills improvement plans (in England). In some emerging sectors of the economy these credentials could be helpful in providing some standardisation of skills requirements.

It would therefore be helpful to explore a range of support and broader incentives that could be put in place for employers to support the provision of workplace training as well as apprenticeships. These types of incentives could help to reduce the burden and perceived risk around return on investment to the employer.

Recommendations



Develop incentives to support smaller employers in the provision of workplace training.

The Treasury should introduce a tax relief on skills investment for businesses, or similar support, to offer better and more flexible training for employees. This could be part of reforms to the Apprenticeship Levy.

The UK Government should formalise the network of intermediary support that has developed in England to establish a national network of high-quality intermediary support for smaller employers to access apprenticeships. This would help smaller employers who have less resources to support learners in the workplace.



Streamline the regulatory framework for apprenticeships.

The Department for Education should streamline the delivery and regulatory aspects of apprenticeships. This includes streamlining the different standards required, as well as the administrative requirements through the different regulators. New standards for apprenticeships should only be introduced where there is a clear need and not just small variations on existing standards. This will help avoid a large proliferation of standards that are only used for small numbers of apprenticeships.

Sustainable funding

We heard from our discussions that in England, further education has experienced a prolonged period of reduced funding. The Augar Review published in 2019 concluded that funding is a challenge in further education in England, particularly for adult learners, and that current funding levels are inadequate to sustain viable institutions across the country (15). This has had a negative impact on staffing and salary rates, leading to a shortage of skilled educators to deliver apprenticeships in STEM areas, such as physics-related apprenticeships (16). In Wales, the Hazelkorn Review published in 2016 has led to the establishment of the Commission for Tertiary Education and Research, a Welsh Government sponsored body that aims to deliver a combined approach to tertiary education with greater collaboration between higher education, further education and adult education (17). In Scotland, the Scottish Funding Council Review published in 2021 proposes measures to deliver a coherent approach to tertiary education that focuses on lifelong learning, research and skills (18).

Greater consideration should be given to the importance of further education in supporting research and innovation. This will require both recasting the concept of technical education and its cultural resonances, as well as enhancing the provision of technical training. We heard from our discussions that funding also represents an ongoing and growing challenge for higher education institutions. Evidence suggests education and research activities in universities are funded at a loss and deficits have been growing (19). In the long term, delivering on the Government's ambitions for STEM skills will require a full commitment to providing funding for high-quality degrees alongside adequate and sustainable funding for the further education sector.

Recommendation



Deploy increased and sustainable funding to ensure the provision of further education.

The UK Government will not reach its goals for R&D or skills provision in England without a sustainably funded, thriving further education sector. Further education that supports delivery of high-quality STEM training must be sustainable in the long-term. This requires increased funding to support quality teaching and infrastructure.

Careers guidance

Young people often lack awareness of different pathways into science and engineering, as well as the wide range of careers that science and engineering can lead to. School teachers and parents/carers, who are known to play an important role in shaping perceptions, may often encourage university as a more esteemed and valued route. Without access to personal experience, it is difficult for teachers or parents/carers to explain the diversity of careers and pathways into science and engineering.

A good quality careers guidance system is crucial in attracting more young people to consider a future in science or engineering. However, careers guidance is often focused on the university route, which can perpetuate the perception that science and engineering are only for the most academically gifted children. This can in turn perpetuate the perception of alternative routes being viewed as lower status, as well as a lack of understanding about the wide range of careers science and engineering can lead to (16). 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 (20). Providing schools with clear access to resources showcasing the careers of scientists and engineers should be a priority. The Gatsby Good Careers Guidance Benchmarks are a framework of eight guidelines for good careers education, developed to support schools in providing students with the best possible careers guidance (21). The latest careers strategy in England was built around these. Although the Government's 'Skills for Jobs' white paper included plans to strengthen careers advice, the current careers strategy in England ended in December 2020 and as of May 2023 is yet to be replaced.

The ease of access to information can have a significant impact on students' decisions. EngineeringUK 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 (22). Lack of access to robust careers advice can further increase disadvantages across the UK. Again, organisations like STEM Learning provide a range of support for schools to help them adhere to the Gatsby Good Careers Guidance benchmarks (23).

Robust careers guidance is not the only factor in creating a more inclusive culture for science in schools. Enhancement of resources available to careers leaders in schools can help to show the sheer diversity of careers within science and engineering. Being able to articulate the number of pathways to science and engineering, for example through T-levels, apprenticeships, BTECs as well as the wide range of career options, can help in showing young people they do not have to go to university to become a scientist, engineer or technician. Better signposting to the diversity of education pathways into professions is the focus of Gatsby Benchmark 7 (23). The Baker Clause, which was

introduced in 2018 as an amendment to the Technical and Further Education Act 2017, and which has recently been updated, states that schools must allow colleges and training providers access to every student in years 8 to 13 to inform them about non-academic routes, and that schools must impartially promote the full range of technical education qualifications and apprenticeships (24).

Schemes such as STEM Learning's [STEM Ambassador programme](#) are a fantastic tool in giving schools not only the chance to invite a professional scientist to talk to pupils, but also draw upon a diverse range of people that can inspire those from all backgrounds that careers in STEM can be for them. As well as ensuring that young people have access to high quality careers guidance, parents/carers also need to be made aware of education and training pathways available to support young people. The Gatsby Foundation has developed [Talking Futures](#), a toolkit aimed to support parents in talking about education and career pathways.

Recommendation

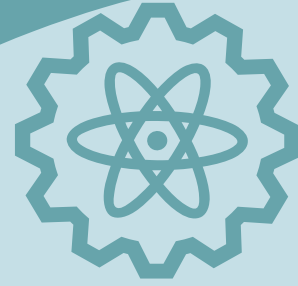


Renew and reinstate the careers strategy in England and build on progress to strengthen science and engineering guidance.

There have been improvements to STEM careers advice in England, including the development of the Gatsby Benchmarks and STEM Careers Toolkit, which have made progress in embedding STEM specific content into the careers strategy. The current strategy in England ended in December 2020 and is yet to be replaced. It is important to continue to build on this progress, including updating and refreshing the strategy, and supporting education providers and schools to implement recent legislative changes and guidance.



Geographical Considerations



Supporting local talent and innovation



Improving regional economic growth through R&D investment is an important political priority (25). Recently, the UK Government announced the creation of 12 high-potential knowledge-intensive growth clusters across the UK, to be based around universities, to accelerate research and innovation in the UK's most promising sectors (26). The scheme is backed by £80m of investment over five years for each of the clusters in England. Strong local leadership from devolved Governments, local government, civic groups and the research sector will be needed so that each of the clusters can have ownership of decisions and have the biggest impact possible in their local areas. In addition, it will be important to ensure that central and local government work together to improve coordination between local and national priorities for skills and R&D.

Our discussions stressed that there is a need for home grown talent within the UK R&D system. The sourcing of talent from abroad into local regions, while sometimes necessary, is not sustainable and often leads to a high level of turnover and exit. Different areas of skills provision have a role in developing local talent and supporting local innovation. Certain career routes, such as apprenticeships, can help with the recruitment and retention of local talent within a region. From our discussions, we heard evidence that apprenticeship retention rates are often higher than for graduates, which can help to build a long-term and sustainable supply of skilled talent. Apprenticeships can also help to support knowledge transfer to businesses in a region. For example, in England, Local Enterprise Partnerships that work with further education colleges can help smaller businesses to connect with local communities in a region. This can be through help in accessing the Apprenticeship Levy, using apprenticeships as a tool to upskill the workforce, and enabling collaboration between different parts of the research system.

Attracting and retaining local skills requires better marketing and raising awareness about opportunities across all regions of the UK. Our discussions revealed that in certain regions of the UK there is a disconnect between the availability of opportunities and the talent required to fill them. Despite the availability of either opportunities or people with the right skills, individuals, schools and businesses often lack awareness or have the perception that these are not present. Young people are insufficiently exposed to local employers to understand that apprenticeships are viable and valuable education and career opportunities (16). In addition, our discussions stressed that while people often want to stay in their local area, they are not necessarily aware of the breadth of R&D-related roles and how these present relevant opportunities for them. It was suggested that it would be beneficial to better highlight the breadth of R&D related opportunities and broaden the conception of R&D related roles.

More generally, making places more attractive to live will help to retain skilled people and support the regional diffusion of innovation. This includes considerations around better housing and transport infrastructure, cost of living, ease of access and local funding sources, amongst other factors (25). For example, in our discussions in Scotland, areas outside of skills, such as infrastructure, quality of life and the affordability of housing were highlighted as crucial to making Scotland an attractive place to stay and build a career.

England

The focus on regional areas of R&D excellence in England will require considering skills requirements and challenges at a regional and local level, to ensure that different regions can attract talented scientists and researchers. Regional skills needs are often different to overarching national skills priorities, in part driven by local R&D strengths. It is therefore important to develop skills that match existing local opportunities rather than focusing on developing generic skills requirements. The Department for Education has established Local Skills Improvement Plans across England to make technical skills training more responsive to local employer skills needs (27).

Scotland

In our discussions it was clear that lifelong learning and reskilling was an important part of the skills question in Scotland given its particular demographic situation, with an older population than England and lower levels of immigration. Funding is important to enable people to continuously build skills throughout their careers in Scotland.

Whilst there are challenges in the Scottish skills system that need to be addressed, there is a lot of great opportunity. In our discussions it was highlighted that Scotland is a small country and so can more easily bring together the critical mass of people needed to deliver strong and meaningful change and this should be exploited. Bringing together examples of how the system can really excel and highlighting solutions can have a big impact.

Wales

Wales has recently implemented a range of measures to support current and future skills. It has introduced a new education curriculum, which places a greater emphasis on skills and lifelong learning. Regional Skills Partnerships have been established to support local and regional skills requirements. They bring together employers, skills providers and local stakeholders to identify current and future skills requirements and challenges at a regional and local level. The Regional Skills Partnerships take a strategic and long-term view of regional opportunities and skills requirements. They have developed Skills and Employment Plans, which outline three overarching skills priorities, which are based on regional needs and are required to support sector growth in the economy.

A significant challenge for Wales is the loss of European Regional Development Funding following the UK's exit from the EU. The funding supported high level skills capacity for R&D, and UK replacements – primarily the UK Shared Prosperity Fund, as well as the Levelling Up Fund – do not target research and innovation in the same way.

There is a challenge in the sourcing and retention of local talent. We heard from our discussions that despite the availability of opportunities locally, in some regions there is a lack of skilled talent to fill them. An example was given in North Wales, where young people often seek opportunities outside of the region, partly driven by a lack of awareness of local opportunities. School teachers and parents/carers also lack awareness about local opportunities. It was suggested that science parks could play a greater role in informing schools in the region about available careers and roles in R&D.

Northern Ireland

Our discussions highlighted that Northern Ireland, and in particular Belfast, is perceived as an attractive destination for businesses and foreign direct investment. There are strong partnerships between universities and businesses, with co-design of courses and open access intellectual property policies supporting collaboration. Northern Ireland has implemented a new skills strategy as well as measures to support skills, including in R&D (28). The programme of City and Growth deals is also helping to support innovation diffusion through investing in skills and infrastructure (29).

In our discussions it was highlighted that Northern Ireland is limited by a lack of sufficient absorptive capacity related to skills. We heard that young people often seek better paid jobs outside of Northern Ireland and statistically will not return. A big part of the challenge is the cap on local student numbers, which limits the amount of undergraduate places at universities. We also heard that there are challenges around the current political system that will need to be addressed. This highlights the importance of having the right people in the right place and with the right skills to absorb and apply new ideas to stimulate innovation and growth across the UK.

Recommendations



Increase awareness of available opportunities across the UK and better connect local people with R&D career opportunities that exist locally or regionally.

This should be done for young people through careers advice and guidance in schools and regional campaigns more widely. City and regional deals should use their convening power to lead campaigns to raise awareness. The UK and devolved Governments should ensure careers programmes highlight regional and local opportunities and make connections with local businesses.



Make sure that new clusters have the right skills plans in place by enabling local leaders to take a prominent role.

Leaders from local authorities, and economic development bodies, such as Local Enterprise Partnerships in England, should be more involved in discussions about regional opportunities and skills requirements. It is important that strong local leadership is involved and can own the decisions made by R&D clusters so that they have the biggest impact possible in their local areas. In England, regional structures such as Local Skills Improvement Plans should be leveraged to create a pull for R&D.

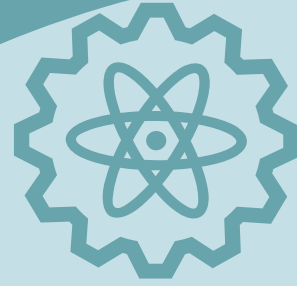


Attract and retain highly skilled R&D talent by making places more attractive to live.

Skills and R&D policy for regional development cannot be considered in isolation. It must be combined with other policy considerations, including around housing and transport infrastructure, to ensure an offer which is attractive overall.



International Talent



An immigration system that attracts international talent



Research is a global endeavour that benefits from collaboration across borders and boundaries. International mobility is important to researchers in both academia and industry. Migration brings great benefits for research, such as increasing collaboration and knowledge exchange. Skilled immigrants bring in new ways of working and can help to increase diversity in the workplace through bringing in different viewpoints and cultural approaches. There is also a long-standing STEM skills shortage in the UK that will not be solved in the short to medium term. The science and engineering community is working, alongside the UK Government, to address the skills shortage but the training pipeline is long and cannot be solved overnight. This creates further need for immigration to fill crucial skills gaps, and the UK needs an internationally competitive immigration offer to attract international talent.

Since 2021, the UK has established a new points-based immigration system for work and student visas following Brexit. The new system has introduced a number of new immigration routes that are intended to be more flexible and make the UK a more attractive destination for skilled scientists and researchers. A particularly welcome change is the introduction of the Global Talent visa, which has replaced the Tier 1 (Exceptional Talent) route, and which allows highly-skilled scientists and researchers to work in the UK on a flexible basis with fewer restrictions and costs than other immigration categories (30).

Despite these positive changes, we heard from our discussions that the UK visa system remains costly and complex, both for migrants and sponsors. The cost of obtaining a UK visa for individuals and their families represents a major issue for many researchers.

Analysis from the Royal Society shows that the total upfront costs of visas are higher in the UK compared to all other countries in the analysis (31). One analysis shows it costs £8,419 in the UK compared to an average of £1,316 for leading science nations, a difference of 540% (32). The biggest upfront cost component is the Immigration Health Surcharge which costs £624 per year. A family of four coming to the UK on a five-year Global Talent visa for the main visa holder and three dependants' visas will be liable to pay £13,372 upfront. These costs can be prohibitive for those least able to afford it, particularly early career researchers, and are making the UK less attractive compared to its competitors (33).

In addition to the cost to individuals, recruitment of international talent is costly and burdensome for employers, such as UK higher education institutions and businesses. Our discussions highlighted that the UK immigration system is complex and navigating it often requires considerable resources, including specialist knowledge and expertise. This means that organisations are less likely to recruit skilled talent due to cost and time. This in particular impacts smaller organisations with less resources (i.e. funding and administrative capacity), such as smaller businesses but also some higher education institutions. The risk is that businesses may look to leave the UK to find a bigger talent pool abroad.

Existing immigration routes also lack flexibility to support mobility on different timescales. Shorter term visas can offer solutions for short term projects, but the time required to obtain them is often not commensurate to the length or value of the visit. In addition, they do not create incentives for people to stay once a project is completed.

Attractiveness of the UK as a destination

There should be considerations around how to make the UK a more attractive destination for skilled scientists and researchers. Some evidence indicates that life in the UK appears to be an attractive proposition for international researchers, but this needs to be converted into relocation decisions to realise the UK's ambitions (33). To attract people with the right skills requires considerations around quality of life, such as affordability of housing, schools, infrastructure and cultural support, amongst others. More needs to be done to create a welcoming environment to attract and retain talent.

The Home Office recently announced restrictions on the ability of international students studying some courses to bring dependents with them to the UK, in response to recent increases in the number of students bringing dependents (34). In addressing these challenges, the UK Government needs to make sure that any policy changes are not considered in isolation. Limiting the number of dependents that foreign students can bring with them to the UK could make the UK a less attractive place to study for international students. In addition, any change that could impact on international student numbers could affect universities' ability to fund research by reducing available income. It is vital that the big picture of the economic benefits of UK higher education and the

sustainability of research funding are not forgotten in the pursuit of short-term reductions in net migration.

There are also Brexit-related challenges around international collaboration, including the ongoing lack of association to the Horizon Europe funding programme. The loss of access to a prestigious funding programme makes the UK a less attractive destination for researchers looking to further their career, who may look to establish in other countries instead. The UK has a good reputation for science, but other attractions are lacking compared to competitors.

Recommendations



Reduce the upfront cost of visas.

The Home Office should reduce the upfront cost of visas in line with international competitors. In addition, a banding system for visa sponsorship fees could reduce costs for smaller businesses. This already exists within the Immigration Skills Charge for the Skilled Worker or Senior or Specialist Worker visas, and this should be expanded to cover additional visa categories.



Provide greater flexibility in the design of visas to support researcher mobility on a range of timescales.

The Home Office should review its provisions for short-term work and collaborative research projects to improve the customer experience and competitiveness of the UK's talent offer. A short-term mobility route should be introduced to enable STEM sponsors to collaborate with researchers. This could include expanding the Permitted Paid Engagement route to researchers up to six months or establishing a non-sponsored route for researchers.



Simplify the visa system for applicants and businesses.

The Home Office should develop support combined with clear signposting to help applicants and businesses navigate the visa system, particularly for smaller businesses and organisations with less resources, as well as organisations that have not previously interacted with the system. The system should be simplified as far as is possible: small, innovative businesses in particular should be able to interact with the system without needing expensive third-party support.

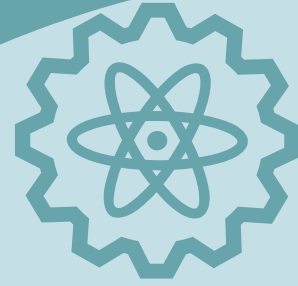


Create and promote a more welcoming environment to attract and retain highly skilled international talent.

The Government should better signpost and promote the UK as a welcoming destination for the world's best science and engineering talent. This could be through leveraging and strengthening existing initiatives such as the UK Government's GREAT Britain and Northern Ireland Campaign and continuing to utilise the Foreign Office's Science and Innovation Network. Ministers must also talk more positively about migration when addressing the British public, recognising the benefits that skilled migrants bring. Settlement can also be used as a mechanism to retain international science and engineering talent by shortening visa timeframe requirements, as is the case with the Innovator and Global Talent visas.



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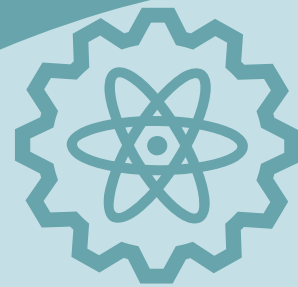
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