Science and Technology Facilities Council (STFC) – Written evidence (PSU0061)

Response from National Laboratories at the Science and Technology Facilities Council

The Science and Technology Facilities Council (STFC), part of UK Research and Innovation, operates large-scale science national infrastructure in the UK in support of the UK academic and business research community, in addition to funding research into astronomy and particle physics. This response is made on behalf of STFC's National Laboratories which include the ISIS Neutron and Muon source, RAL Space and Central Laser Facility in Harwell, Oxfordshire and the Hartree Centre in Daresbury. 2,500 people are employed to build and operate the facilities at the National Laboratories across STFC's sites in Daresbury in the North West, Harwell in Oxfordshire, Edinburgh and Boulby in the North East. The majority of the staff are engineers, technicians and scientists.

As a major public sector employer of scientific and technical staff, the National Laboratories are exposed directly to the STEM skills challenges and would encourage Government to prioritise:

- Encouraging all industrial and public-sector STEM employers to increase Early Careers opportunities, so that more apprentices and graduates start today so that they can build up the necessary experience to avoid the UK facing skills challenges in the future. STFC is already increasing its Early Career opportunities, but could do more to support the wider UK technical skills needed by industry and business, particularly at SMEs. The STFC Skills Factory concept is a proposed pilot that, if funded and successful, could be rolled out to other public-sector organisations to address (at scale) the STEM skills challenges faced by the UK.

- Increasing co-ordination and coherence of skills related activities across Government and supported bodies to increase impact in terms of encouraging more people into STEM careers and finding innovative solutions to address current STEM skills shortages.

2) STEM skills

High growth sectors of strategic national importance, such as space, quantum and fusion are chasing a similar group of experienced engineers, technicians and scientists to deliver on the UK 'science superpower' agenda. Common skills shortages are in mechanical engineering, electrical engineering and computation. The current cross-sector pain point for companies recruiting is not around those straight out of school and university, but those who have been in employment for over five years. These sought-after employees have the on-the-job experience, in both technical knowledge and in how to work in teams and a business environment. This is evidenced by the long list of mid-career vacancies on any STEM employer website, including STFC's[1].

This creates a lot of career advancement opportunities at increased salaries for skilled and experienced individuals, but presents a challenge for Government-

[1] https://www.careersportal.co.uk/UKRI-careers/page/careers-at-stfc-6

funded research and innovation organisations. Across STFC's National Laboratories there has been a two-to-threefold increase in resignation rates in early to mid-career roles averaging between 5 and 8 years' experience with the organisation. Mid-career recruitment is challenging as there is a significant differential between private and public sector salaries. This gap has always existed but is currently getting bigger, as highlighted by UKRI's recent pay benchmarking exercise undertaken by SMRS[2], which found STEM pay for mid-career staff is now 20-40% below the market median for equivalent roles.

The increasing difficulty of recruiting and retaining is putting a number of major large scale investments at risk. For example, of the 41 National Quantum Computing Centre roles advertised since Jan 2021 to April 2022 only half have been filled, with critical technical roles, such as Deputy Director of Research, still to secure a suitable candidate. Recruitment and retention at the Extreme Photonics Applications Centre has been similarly challenging with a 50% vacancy rate and recruitment campaigns frequently re-run 3-4 times without success.

Mid-career recruitment and retention challenges are not new, in fact STFC recognised over a decade ago that it needed to increase its Early Career recruitment as the main route to satisfy its mid-career staffing needs. As a result, STFC ramped up its Early Careers programmes and now recruits ~30 apprentices and over 50 graduates a year. There is consistent strong demand for these high quality opportunities: the schemes typically receive 30 applicants per apprenticeship place and 50 per graduate place.

It could be suggested that to ensure the UK does not face today's skills challenges in the future, all STEM organisations should be encouraged to increase the number of Early Career opportunities they offer. This will increase the volume of trained and experienced employees to meet future skills needs. Small and medium sized enterprises (SMEs) lack the scale, time and fiscal resources to offer many Early Career opportunities, so the onus is on larger firms to over train to ensure that the predicted need for 700,000 technicians[3] over the next decade can be achieved.

STFC has developed a vision for how major scientific/technical organisations (such as STFC) could use their inspiring large-scale scientific and engineering facilities as a hands-on training ground for the next generation. Subject to funding, STFC's Skills Factory would provide more Early Career and re-training opportunities to increase the volume and diversity of technically trained staff available to SMEs in the future. STFC is uniquely placed to deliver this, with its inspirational science facilities across the UK, award winning training schemes and direct links to SMEs through its Campuses at Daresbury in the North West and Harwell in Oxfordshire.

The Skills Factory would recruit 300 trainees a year on a range of one, two and four-year schemes to develop "hands-on" engineering and computing skillsets. Through STFC's Campuses and facilities users, these trainees would have high quality placements at SMEs during their training and increase their likelihood of

[2] SMRS | latest from SMRS

[3] https://www.gatsby.org.uk/education/focus-areas/stem-skills-in-the-workforce

job offers at the end. Skills Factory trainees will be asked to contribute 10 days of schools and community engagement a year, which will be used to improve and diversify STEM take up from primary school upwards. STFC has a proven track record in delivering high-quality training, the challenge is the additional investment required to substantially increase our training offering – the majority of which is required to cover the salaries of the trainees.

The STFC Skills Factory would be a pilot, which (if successful) could be adopted more widely across relevant public sector research and technical organisations, contributing to the STEM skills gap at scale.

3) Education sector

STEM skills challenges are a high priority for businesses and recent Government strategies (Space, Digital, Innovation, etc) have all highlighted the importance of developing skills as part of their successful delivery. As noted there is a large commonality between the skills needed, so a more co-ordinated and comprehensive action plan would be beneficial and enable limited resource to have greater impact.

STEM skills challenges currently sit across Government, with both the Department for Education and the Department for Business, Energy and Industrial Strategy as key stakeholders. In the space sector, where similar domain challenges existed the formation of the National Space Council catalysed cross-Government action to address the burgeoning space industry. A similar approach could significantly improve the co-ordination and coherence of the complex skills landscape. This could also lead to greater impact from wider Government skills-related funding, which is currently relatively small compared to formal education and research support.

There is still a lot to do to ensure that young people maintain their interest in STEM subjects, particularly in under-represented groups. STFC has an active Public Engagement programme to engage teachers and school children from primary to sixth form to broaden horizons and encourage interest in STEM, with a particular focus on working with young people and their communities in higher areas of economic disadvantage through its WONDER[4] initiative.

In 2019 and 2020 STFC public engagement grant holders and National Lab PE teams reached over 750,000 people including 2350 schools and providing CPD to over 2300 teachers. In addition, STFC actively supports the Technician Commitment to recognise, respect and raise awareness of technical roles and their exciting career paths. STFC agrees with the recommendations made by the TALENT Commission[5].

6 September 2022

[4] https://www.ukri.org/what-we-offer/public-engagement/public-engagement-stfc/our-support-for-public-engagement-stfc/public-engagement-wonder-initiative/

[5] https://www.mitalent.ac.uk/Home