

Written Evidence Submitted by The Careers Research & Advisory Centre (CRAC) and Vitae (DIV0050)

Context

The Careers Research & Advisory Centre (CRAC) has expertise and insights into the diversity and inclusiveness of key parts of STEM education and employment, particularly in the UK. We have worked in both education/academia and other industry sectors, which gives us a rare view and expertise to inform this submission. We are confident, for example, that there is merit in work that has been done in some industrial sectors and that could be transferred into academia, in relation to making the workforce more inclusive.

CRAC undertook several of the research studies for the Royal Society and others that are quoted in the Call for Evidence. We are experts on the data available about both higher education students and the academic workforce, for which groups there is much more systematic data than for other segments of the STEM workforce, and analysing it. That expertise has revealed, for example, that the issue of nationality is actually critical when considering ethnicity in the workforce. Within academia, the ethnic diversity of early-career research staff is increasing quite fast overall, but this is largely because of inward mobility of male scientists from Asia which overshadows any enhancement to the ethnic diversity of UK-domiciled staff. In industry, many companies operate internationally and regard their workforces on a global basis, so a lack of diversity within the UK may not worry them if they have operations based in Asia. On the other hand, in the UK we only collect ethnicity data about UK-domiciled students, so any trends of comparison may be unreliable. These sorts of detailed insight mean that the scope of an inquiry such as this needs to be very carefully considered and established.

• the nature or extent to which women, ethnic minorities, people with disabilities and those from disadvantaged socioeconomic backgrounds are underrepresented in STEM in academia and industry;

Depending on the scope of the question, it is currently difficult to understand the full picture of under-representation (or differential attainment) and how this may have changed over time. Much more is known about students in education, especially higher education, and about the academic workforce because of the activities of HESA. However, it is more problematic to try to define the profile of the STEM workforce beyond academia, due to the lack of systematic data and global mobility within industry workforces.

BEIS is attempting to establish more about the Research & Development workforce in the UK by commissioning a biannual workforce survey (Vitae is part of its advisory group), but that workforce is potentially wider than STEM in terms of disciplines or sectors but narrower in terms of occupational levels.

There is a patchwork of information about different segments and very little connectivity between the datasets that do exist, outside higher education. What we can see, however, is that within almost all those segments, there are profiles that suggest one or all of the groups mentioned are under-represented in some way, but not always in the same way. In education, girls and women generally outperform boys and men but the reverse tends to occur in transitions into the workplace and in progression within it. The picture for ethnicity is much more nuanced but worst, by far, for those of Black background.

The under-representation of Black scientists within (HE) research careers, is acute in some disciplines. The new analysis and statistics below demonstrate there is attrition along the progression path of UK domiciled Black scientists, who comprise:

- 8% of undergraduates
- 2.2% of PhD students
- 1.4% of postdoctoral/research staff
- 1.4% of lecturers or research fellows
- 0.7% of Readers or research leaders
- 0.4% of Professors

At the professorial level, 0.4% equates to a total of just 25 Black UK professors in STEM, out of a total professorship of over 6600.

Studies by CRAC of engineering students¹ have statistically proved that strong variances in graduate outcomes occur with ethnicity, even after controlling for attainment and university type – and even in the context of an industry short of skills and seeking greater diversity. The factors behind this are potentially complex.

A tidal wave is coming in terms of the proportion of people who consider they are disabled, once mental health and learning conditions are taken into account. Far more young people appear to be willing to declare a condition: perhaps 1 in 4 HE students do so (depending on how the question is asked), whereas at senior levels of academia such as professors it is less than 1 in 40.

Finally, on socio-economic background, we know that this is an increasing focus for industry, with employers seeking to play their role in fostering social mobility. But, once into higher education (for example), many students wish to be judged on their own independent merits and mask that background. Measures of socio-economic background are contested, especially beyond the realm of higher education.

• the reasons why these groups are underrepresented;

There are many reasons for the varying instances of under-representation that occur for different groups and in different settings. If the UK wants large scale systemic change, we need to collectively think not just about who enters STEM, but progression and transitions, including who leaves and when.

• the implications of these groups being underrepresented in STEM roles in academia and industry;

It is increasingly recognised that diversity is a crucial aspect within aspirations for excellence in research, science and technology globally. There is growing evidence that greater diversity within any workforce and more inclusive working cultures support increased innovation and creativity, and some evidence that they can enhance productivity. Over the past few years, the UK discussion around the need for gender equity in universities has

¹ [employment-outcomes-of-engineering-graduates-key-f \(raeng.org.uk\)](https://www.raeng.org.uk/publications/reports/employment-outcomes-of-engineering-graduates-key-f)

evolved to a broader debate around creating a more inclusive research culture across the board. How the research environment and culture is impacting on the progression, inclusion and diversity of researchers, especially those from minority ethnic backgrounds, has been under the spotlight. Underrepresentation fosters more underrepresentation, but how we break this cycle is complex and needs sustained focus and investment.

• what has been done to address underrepresentation of particular groups in STEM roles; and

UK has spent over £1BN on trying to increase the availability of STEM skills by encouraging more young people to study STEM subjects and enter STEM careers. Much of this has been focused on increasing the participation of under-represented groups (particularly young women), through activities and initiatives loosely known as STEM enrichment.² It is widely agreed that the enormous array of well-intentioned offers and opportunities, from a myriad of actors, confuses key players such as schools and that some of them have little effect or impact. We welcome the ‘rationalising’ initiatives from the engineering sector (‘Tomorrow’s Engineers’) and of the Careers & Enterprise Company which have taken the view that the impactful opportunities need to be amplified, while the ineffective ones should winnow away. Assessing the impact of opportunities from providers, and supporting those that are proven effective, are beneficial to all parties.

We sense that a similar explosion of activities may be occurring from multiple actors with the intention of diversifying the STEM workforce, in addition to the STEM enrichment scene. At this relatively early point in evolution of the D&I agenda, it could be useful to introduce some similar ‘rationalising’ and ‘proving’ methods, so that the most effective initiatives are increased in their reach and ineffective interventions quietly reduced.

• what could and should be done by the UK Government, UK Research and Innovation, other funding bodies, industry and academia to address the issues identified.

We recommend the Government and stakeholders consider:

- establishing a systemic approach to track the long-term career paths of all researchers to identify their impact and economic contribution and assess the supply and demand balance
- learning lessons from the significant and sustained investment and successes in widening the participation of undergraduates in higher education.
- establishing a *What works* centre for diversity in STEM to share good practice and act as an independent centre of expertise, providing all those that wish to enhance diversity with research, toolkits and evaluation guidance so that initiatives are well-founded and effective
- consider and understand how you can have aspirations for academic/scientific excellence and greater diversity at the same time, because currently they tend to work against each other

About CRAC/Vitae

² [Delivering STEM \(Science, technology, engineering and mathematics\) skills for the economy \(nao.org.uk\)](https://nao.org.uk/publications/delivering-stem-skills-for-the-economy)

The Careers Research & Advisory Centre (CRAC) is a limited company established in 1964 and registered as a charity. We provide research, expertise and innovation to those who support career development at all ages and across all sectors.

CRAC manages Vitae, a programme supporting the professional development of researchers which works with HE institutions as they strive for research excellence, innovation and impact. The UK leads the world in this type of support for researchers, as a result of Government and HE sector investment, through Vitae and its precursors working alongside HE institutions.

We have particular interest in graduate outcomes, employability development, work experience and internships, careers interventions, careers information and decision-making, STEM and postgraduate careers. Through our work connected with Vitae, we have deep and significant expertise in academic career development and progression in the UK and have conducted numerous research and evaluation studies relating to the research and academic workforces.

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