

Written Evidence Submitted by Professor Lucy Berthoud on behalf of members of the Space Universities Network and colleagues at the University of Bristol Aerospace Department
(SPA0088)

Professor Berthoud is the Co-Chair of the Space Universities Network, a group of 90+ academics from 39 Universities that teach space subjects around the UK. She is also a member of the Space Skills Advisory Panel for the UK Space Agency.

In this response I provide recommendations and evidence for the 'skills and diversity' terms of reference set out in the consultation.

Paragraph 1: Interest in space "Peake"ing

Interest in space amongst STEM and other students in the UK has increased dramatically over the past 5 years due to the 'Tim Peake' effect (our UK astronaut), private sector exploration (Space X and Virgin Galactic type missions), and the prospect of spaceports opening in the UK. Many young people perceive the industry as an exciting and attractive area in which to work. This sector offers jobs of high added value and keeps highly skilled people in the country and offers an exciting area for growth for the UK.

Evidence:

- Numbers at the University of Southampton Aerospace and Astronautics master's in engineering (a 4-year course) have risen from 377 in 2013/14 to 693 in 2020/21, a growth of 84%.
- Numbers at the University of Bristol Aerospace master's in engineering (4-year course) have risen from 109 per year in 2014/15 to 221 per year in 2020/21, a growth of 103%
- Numbers on the University of Kingston Aerospace master's in engineering course have risen from 185 in 2016/17 to 334 in 2020/21, a growth of 81%. These numbers are typical examples of trends across the sector.

Recommendations

- The government should do more to capitalise on current surge in interest in space amongst young people.
- The government should ensure that we have the world-beating scientists and engineers to supercharge the UK's growth potential in space and across all regions of the UK. This will require building capacity with HE providers, increasing funding for higher level apprenticeships within the sector and incentivising greater collaboration between industry and HEI in the development of space related courses.

Paragraph 2: Space needs everyone!

Space today is more than STEM skills, it requires marketing, financial and business skills. Other countries are already ahead of the UK in providing new courses to attract both early- and mid-careers business staff into the sector.

Evidence:

- US universities are ‘rocketing’ to fill demand in new space entrepreneurship, management, and law courses. For example, Arizona State, University of North Dakota, Rice University Houston, Embry Riddle Aeronautical University have all recently started space policy, leadership, and business degrees [1].
- According to the Space Skills Survey 2020 [2], “43% of space businesses located skill gaps in their managerial or entrepreneurial functions”.

Recommendations

- To build the profile of the space sector within STEM and non-STEM job markets to ensure that the industry is perceived as innovative and creative.
- Improve career guidance so that the breadth of space sector opportunities is more explicit to young people.

Paragraph 3: Skills gap in the Space Industry at Degree +5 years level

As discussed in the ‘Space sector skills survey’ from 2020 [2], recent growth in the sector has placed stress on skills supply and there is a lack of resources in the many new small space businesses to supply internal training. Evidence shows that the space industry has sky-high expectations of recruits and pay within the sector does not reflect skill level at the Degree+5yrs stage. All of this means that a perfect storm at Degree+5 years level has arisen, with companies forced to ‘poach’ from each other rather than drawing from outside the sector.

Evidence:

- Two thirds of space businesses who sought to recruit had trouble recruiting [2].
- Skills gaps were identified by 51% of businesses (a much higher proportion than that for businesses across all UK sectors). 86% of these were in their scientific, engineering, or technical functions [2].
- 23% of Space businesses struggle with retention of staff [2]
- There is an expectation of growth over the next 3 years in 75% of the businesses surveyed in the space sector skills survey and all job types are expected to be ‘very’ or ‘moderately difficult’ to recruit.
- Airbus announced 1700 job cuts, Rolls Royce 3000, and British Airways 12000 [2] because of the pandemic’s bonfire of jobs in the aviation sector. Many skilled engineers in this sector, and potentially others, will therefore need some retraining.
- Advances in blended learning over the pandemic offer opportunities for offering training with wider access.

Recommendations

- Support for a ‘National Space Skills Institute’ (NSSI) which will tackle the skills and knowledge gap currently hindering growth of the space sector in the UK. It could provide access to training for workers in the space sector and to those entering it, focusing on the skills and knowledge to support the future space workforce.
- Support for a new Graduate/ ‘New Entrant’ training programme for the space industry to develop the space sector specific skills of graduates
- The government should create opportunities to retrain highly skilled staff from the aviation industry who have been impacted by the fall in demand caused by Covid 19

Paragraph 4: Women and Ethnic minorities are under-represented in the Space sector

Whilst the industry recruits easily across cultures, ethnicities, and nationalities, the number of women employed in the industry is under-representative of the working age female population. Female recruitment suffers from the historically lower proportions of girls and young women studying STEM subjects in schools and colleges.

Evidence:

- According to the 'First results from the 2020 Space Census' report [4] - a survey of 1500 people across the sector - women are under-represented (29%), particularly in industry (22%) and military (17%). This follows general trends in STEM subjects but is higher than the aviation sector in general.
- According to the same report [4], Ethnic minorities are under-represented (11% vs 14% in the population at large), particularly in industry and government, and compared to STEM graduates.

Recommendations

- Encourage space employers to develop practical actions to make the sector attractive to everyone.

References:

[1] Times Higher Education 13th May 2021 "[Space Programmes rocket to fill demand](#)".

[2] <https://www.gov.uk/government/publications/space-sector-skills-survey-2020-research-report>

[3] House of Commons Transport Committee: [The impact of the coronavirus pandemic on the aviation sector - Second Report of Session 2019–21](#)

[4] Space Skills Alliance and Space Growth Partnership's Space Skills Advisory Panel: [First results from the 2020 space census](#)

(June 2021)