



1 THE SCIENCE COUNCIL

- 1.1 The Science Council is a membership organisation of learned societies and professional bodies drawn from across science and its applications. Collectively our members represent almost 500,000 individuals including scientists, teachers and senior executives in industry, academia and the public sector. There are currently 41 member organisations: a list is attached. In addition to providing a mechanism for the sector to work collectively, the Science Council develops and leads collaborative projects working with member organisations and the wider scientific community: examples include LMI analysis of the UK Science Workforce and Diversity, Equality and Inclusion.¹
- 1.2 The Science Council's principal area of work is to advance the professional practice of science across the breadth of the science workforce, including non-graduate and technical roles in science. A key aspect of this is professional registration and having introduced Chartered Scientist (CSci)² in 2004, the Science Council has added Chartered Science Teacher (CSciTeach), Registered Scientist (RSci) and Registered Science Technician (RSciTech).³ RSci and RSciTech aim to raise the profile, aspirations and retention of scientists at graduate and technician level.
- 1.3 In preparing this submission we have consulted with member organisations to identify areas of common interest. In addition a number of member bodies will be responding individually to the inquiry.

2 THE VALUE OF POSTGRADUATE EDUCATION

- 2.1 Postgraduate education plays a valuable role in training a highly-skilled UK science workforce. Demand for workers with science qualifications, particularly at postgraduate level remains strong.⁴ Postgraduate education is a crucial mechanism that enables individuals to increase their levels of knowledge and skills and in science it is the mechanism for enabling the discovery of new ideas, create high-value jobs and fuel economic growth. While postgraduate education can bring benefits to the individual it is also clear that the economy and society also benefit significantly.⁵ Investing in the skills pipeline will also increase the attractiveness of the UK to domestic and overseas businesses to invest both R&D and commercial translation activities in the UK.⁶
- 2.2 As science becomes more complex and interconnected the roles undertaken by scientists now often require longer periods of education and often also some time developing research and investigation skills. The UK needs to encourage and facilitate the most able home-grown science graduates to continue onto postgraduate study in science. But it also needs to attract the world's brightest and best students and postgraduates to come to the UK as a vital component of developing a highly-skilled workforce. The UK's global reach and reputation for excellent science in the 21st Century is underpinned by the strength of this postgraduate training environment.
- 2.3 Across the science professions, for example in the environmental sciences⁷, in many geoscience professions and other sectors in industry, it is increasingly the case that postgraduate-level qualifications are a minimum requirement for employment. Recent research undertaken for the Science Council found that postgraduate workers make up

¹ <http://www.sciencecouncil.org/content/diversity-equality-and-inclusion>

² <http://www.charteredscientist.org/>

³ <http://www.professionalregisters.org/>

⁴ <http://www.smf.co.uk/wp-content/uploads/2013/03/Publication-In-The-Balance-The-STEM-human-capital-crunch.pdf>

⁵ <http://www.universitiesuk.ac.uk/highereducation/Documents/2014/PostgraduateTaughtEducationTheFundingChallenge.pdf>

⁶ <https://www.epsrc.ac.uk/newsevents/pubs/econreturnsengresreport/>

⁷ <https://www.the-ies.org/resources/members-employment-report-1>

26% of the UK science workforce, compared to 13% in non-science sectors and this trend is growing. The research shows a total of 1.4 million people with postgraduate qualifications already in the UK science workforce.

- 2.4 It is essential that course quality and the confidence of both individual students and employers are maintained across a range of different postgraduate provision. It is also vital that postgraduate courses remain open and accessible to all with the appropriate abilities and commitment. The UK science base needs to continue to be broadly-based supporting a research portfolio that will enable research, and research skills to develop. Prioritisation is likely to lead to partisan interests making the case for projects within their own area, pitching one area of research against another. Failure to maintain a broad base for postgraduate education and training could lead to near total loss of national capacity because it sends a message to graduates and prospective students that their particular area of research is not supported, thus incentivising home-grown and international students to look for postgraduate opportunities elsewhere.

Research Masters

- 2.5 Research Masters courses focus on students undertaking in-depth and innovative research within a particular academic discipline that contribute to the development of the research base. Importantly Research Masters provide students with the skills for postdoctoral research, while also enabling them to develop high-level science skills and knowledge that can be usefully used elsewhere.

Taught masters

- 2.6 Taught Masters courses provide the foundation for a career in a number of science disciplines for those that do not intend to go on to postgraduate research, and as previously noted may be a formal requirement for many. These courses enable science graduates to gain additional expertise in the application of science knowledge in a specific area as well as other skills that enable them to practice in a particular field. As science becomes ever more interdisciplinary and complex, the UK needs more people with this higher-level scientific knowledge combined with skills that may overlap with other areas such as law, regulation or business.⁸
- 2.7 A broadly based academic and research environment can also facilitate the interaction of science postgraduates with other subject disciplines which will equip them to explore and develop innovative approaches to complex global issues, such as disease prevention, climate change, and food security. In addition, the growing emphasis from high-tech businesses on translational mechanisms for science research will demand science students acquiring a particular wide range of skills.

3 IMPROVEMENT IN HIGHER EDUCATION CAREERS SERVICES TO INFORM STUDENT CHOICES

- 3.1 Careers services in higher education need to be resourced to provide clear information, advice and guidance on the range of further study options and career paths open to students, both within and outside academic and research-focused roles. But there also needs to be greater recognition that there are many career options other than academia or research for students with postgraduate qualifications in science.
- 3.2 It is disappointing that the perceptions of many postgraduate students is that the only possible career is in research and this perception needs to be challenged strongly. Such a view may also inhibit some able students from taking up postgraduate study as they see it as both expensive and career limiting, providing incentives for science graduates to pursue non-science postgraduate options.
- 3.3 HE Careers advisers need to have a much better knowledge and understanding of the

⁸ <http://www.sciencecouncil.org/10-types-scientist>

labour markets for science postgraduates, nationally, locally and globally. For the most part this information is readily available.

4 PUTTING POSTGRADUATE EDUCATION ON A STABLE FINANCIAL FOOTING

- 4.1 The Science Council welcome's the Government's intention to put funding for postgraduate education on a sure and long-term financial footing. Recent reductions in Research Council funding for taught Masters courses and studentships in a number of critical and strategically important research areas has been a concern for our members for some time: for example the reduction in NERC studentships for taught MSc courses in geophysics.
- 4.2 While the introduction of postgraduate loans is welcome, it is essential that this funding is additional to existing funding mechanisms, not a replacement for cuts elsewhere: the essential background is that the UK needs more science postgraduates, not fewer.
- 4.3 Recent increases in university tuition fees have left undergraduates with much higher levels of debt than hitherto, and while some may be willing to take on additional debt for further study, the science community is concerned that many excellent students are put off by this, particularly those from poorer backgrounds. Any new loan system should be underpinned by a strong evidence base, which takes into account the totality of recent funding reforms and their impact on the higher education sector.
- 4.4 Without assistance for maintenance costs many graduates will continue to be dissuaded from undertaking postgraduate study, particularly with high living costs.⁹ For many, the proposed loans will not be enough to cover rent, let alone tuition fees. The Royal Society of Chemistry has told us that the full cost of a PhD (typically taking 3-4 years) would not be covered by a £25,000 loan.
- 4.5 International students studying in UK higher education institutions have been crucial for maintaining the viability of specialist courses across science and technology disciplines particularly at postgraduate level.¹⁰ Without this contribution UK students' options will be narrowed through increased costs or closure of particular courses. This has a significant knock-on effect for science-based industries and the UK's existing competitive advantage as a world-leader in science. To help ensure the long-term viability of these courses, Government must convey the message that Britain is open and welcoming to international students.

5 ENCOURAGING BUSINESS TO CONTRIBUTE TO EMPLOYEE EDUCATION AND TRAINING

- 5.1 While there is clear merit in a strong employer input to shaping and commissioning skills needs, employers are always more likely to prioritise support for training relevant to the company or organisation rather than the longer term development needs of the individual. Many individuals particularly in science, will not work for a single employer for the whole of their career and 68% work for SMEs: these individuals will understand the need to shape and support their own skills development during their working life. Postgraduate qualifications play a key role in this development. Linking postgraduate science degrees to professional registration¹¹ could be a way of ensuring learners gain the transferable skills as well as maintaining the professional standards sought by employers across all employment sectors.
- 5.2 In comparison with larger employers that are likely to be able contribute financially to employees' postgraduate education and training, many SMEs may not have the resources to do so and consequently their workforce becomes less competitive. While the employer may be able to recruit younger better qualified new staff, there is a

⁹ <http://www.nus.org.uk/en/news/press-releases/nus-figures-show-new-students-face-cost-of-living-crisis/>

¹⁰ <http://www.parliament.uk/business/committees/committees-a-z/lords-select/science-and-technology-sub-committee-i/news/stem-report-published/>

¹¹ <http://www.charteredscientist.org/about-csci/benefits>

danger that without accessible postgraduate education those already in the workforce are left behind and move away from science employment. As a country the UK needs to do more to retain and re-train its qualified science workforce. Government needs therefore to provide employers of all sizes with appropriate mechanisms that will support and encourage them to contribute funding to employees' postgraduate education.

- 5.3 Distance and on-line learning, part-time courses and other ways in which postgraduate study can be undertaken alongside work must be explored if the UK is to succeed in the global competition for advanced science talent and skills. Increase leadership and investment from Government may be necessary to drive this forward.

6 WIDENING ACCESS TO POSTGRADUATE EDUCATION

Diversity across higher education

- 6.1 The Science Council welcomes the Government's focus on better understanding, and removing existing barriers to postgraduate education.
- 6.2 The Science Council is committed to supporting a more diverse science workforce.¹² A number of our members are committing time and resources to monitoring the diversity of their own membership which will lead to improved information about the particular characteristics of their membership. This activity is in its infancy but could identify where any barriers to access to the science professions might exist.
- 6.3 Many of our members have expressed a desire to access and use HESA data, for example, to help them plan and evaluate their diversity work but are restricted by the cost of acquiring the relevant data.
- 6.4 The Government should make HESA and other data sets more readily available. Government should also encourage university departments to report on all aspects of diversity including participation in postgraduate study and education. This could help to focus attention and effort on where least progress is being made. The voluntary approach recommended by Lord Davis could be used as a template for the higher education sector.

Returners to employment

- 6.5 There needs to be some consideration of a financial package for those over 30 years of age who have not yet begun a postgraduate qualification. There are many reasons why individuals postpone entry into postgraduate education, such as looking after elderly or sick relatives, or other financial responsibilities and they should not be penalised for making such decisions.
- 6.6 Given the Government's stated aim to support social mobility and lifelong learning through access to higher education¹³, determining loan eligibility solely by age will limit the success of this strategy. The Science Council is keen to see greater fairness brought to funding for postgraduate education. We recommend that loan eligibility is determined solely by whether an individual has achieved a postgraduate qualification, rather than by age.
- 6.7 The Science Council would caution against enabling HEIs alone to determine which postgraduate courses would be eligible for loans. Such an approach would be inconsistent with Government's intention is to enable students to make considered and informed decisions about pursuing further study at this level.
- 6.8 A mechanism will be required to ensure that funding originally received for the training of postgraduates is used for that purpose explicitly and ensures there is no cross-subsidisation of non-training university expenditure.

¹² <http://www.sciencecouncil.org/content/declaration-diversity-equality-and-inclusion>

¹³ <https://www.gov.uk/government/speeches/supporting-social-mobility-and-lifelong-learning>

Member Organisations of the Science Council

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Association for Clinical Biochemistry and Laboratory Medicine
Association of Neurophysiological Scientists
Association for Science Education
British Academy of Audiology
British Association of Sport and Exercise Science
British Computer Society
British Psychological Society
British Society of Soil Scientists
Chartered Institution of Water and Environmental Management
College of Podiatry
Energy Institute
Geological Society of London
Institute of Biomedical Science
Institute of Brewing and Distilling
Institute of Corrosion
Institute of Food Science and Technology
Institute of Marine Engineering, Science and Technology
Institute of Materials, Minerals and Mining
Institute of Mathematics and its Applications
Institute of Measurement and Control
Institute of Physics and Engineering in Medicine
Institute of Physics
Institute of Science and Technology
Institute of Water
Institution of Chemical Engineers
Institution of Environmental Sciences
London Mathematical Society
Mineralogical Society
Nuclear Institute
Oil and Colour Chemists' Association
Operational Research Society
Physiological Society
Royal Astronomical Society
Royal Meteorological Society
Royal Society of Chemistry
Royal Statistical Society
Society for Cardiological Science and Technology
Society for General Microbiology
Society of Biology
Society of Dyers & Colourists
The Organisation for Professionals in Regulatory Affairs