

Response to: *Consultation on careers guidance for schools, sixth form colleges and further education institutions*

The Science Council

1. The Science Council is an umbrella organisation of nearly 40 learned societies and professional bodies in the UK drawn from across science and its applications: a list of member organisations 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 bodies and the wider scientific community: examples include the Future Morph¹ web site designed to provide information about careers opportunities, and LMI analysis of the UK Science Workforce.²
2. The Science Council also works to advance the professional practice of science and since 2004 has awarded the professional qualification of Chartered Scientist (CSci). It is now leading an initiative that aims to raise the profile, aspirations and retention of technician and graduate scientists through professional registers at these levels (Registered Scientist and Registered Science Technician). Collectively our member bodies represent more than 400,000 individual members, including scientists, teachers and senior executives in industry, academia and the public sector.
3. In modern societies there is an increasing demand for a workforce with science and technology skills. UKCES estimates that 58% of all new jobs will be in science and technology. For the UK to compete in a global economy it is vital that young people are made aware from an early age of the careers available for those who study science and maths and the role of careers awareness and information in this area has never been more important. In addition, at a time when young people are expected to make an increasing financial contribution towards their education and training, it is crucial that they are able to access accurate information, advice and guidance to inform their choices.

Introduction

4. Science is ubiquitous in modern life and it is important that young people understand the relevance of science and mathematics to their lives and their future careers. There is well-documented demand for science, technology, engineering and mathematics (STEM) skills in the current UK economy. The UK must therefore significantly increase the numbers of young people attracted to the study of STEM subjects as a basis for education, training and skills for the future workforce.
5. The Science Council welcomes the proposal to extend the duty to secure access to independent and impartial careers guidance down to Year 8 pupils and upwards to the age of 18. Careers awareness for young people enables them to make informed choices regarding their education and training and this should remain a priority for the Department for Education.

¹ <http://www.futuremorph.org/>

² Jon Guest and Fiona Dodd. "The current and future UK science workforce", (Sept. 2011). TBR, http://www.sciencecouncil.org/sites/default/files/UK_Science_Workforce_FinalReport_TBR_2011.pdf, accessed July 2012

6. All young people are entitled to accurate and appropriate information on careers from science³ and mathematics, with knowledgeable advice and guidance from qualified advisers who are aware of the diversity of sectors employing scientists, engineers and mathematicians.

The role of 'careers guidance'

7. In its 2010 report the Science and Society 'Science for Careers' Expert Group⁴ considered the elements that contribute to and support decisions about careers, and the group developed the concept of 'careers awareness'. When added to the traditional elements this gives rise to Careers Awareness, Education, Information, Advice and Guidance (CAEIAG) and it is important to understand the distinct role of each element:

Awareness of different employment sectors and the range of career options available generates the interest to seek out information⁵. The Science Council's own Future Morph⁶ website is an example of a careers awareness project.

Education consists of programmes and activities of learning to help people to develop the skills necessary to manage their career and life pathway. These include accessing and making effective use of career information and guidance.⁷

Information refers to the provision of facts and figures relating to learning and careers, but without discussion about the relative merits of different options. Information can be imparted verbally by a careers adviser or by printed material and the internet.⁸

Advice requires more in-depth interaction with the client. It includes the explanation of information and explanations about how to access and use information.⁷

Guidance involves an in-depth session or series of sessions between the client and careers adviser, in which the careers adviser helps the client through the process of making decisions about learning and careers.⁷

8. Careers AEIAG is necessary to support the choices of young people. Research^{9 10} has shown that whilst many young people state their enjoyment of science they do not visualise themselves working in science. Raising awareness of the variety of career opportunities available from studying science at the earliest possible age should be seen as part of the solution to increasing the numbers choosing science subjects post-16. King's College London research¹⁰ into the career aspirations of young people indicates that stereotypes and self-identity in relation to science careers is well developed by the age of 11. These findings support the case for early careers work that helps to increase the diversity of the pool of young people choosing to pursue STEM studies, particularly in relation to gender, ethnicity and socio-economic background.
9. There is no 'one size fits all' approach to careers AEIAG. Children and parents differ in the level of access they have to careers information. Research shows¹¹ that the medium through which information is presented to young people across different social groups play a significant role in shaping attitudes towards pursuing a career in science.

³ The knowledge and skills gained through science qualifications can lead to many careers **from** science as well as **in** science. The wide range of employment destinations for those with science qualifications exemplifies this.

⁴ BIS Science in Society Expert Group, Science for Careers 2010

⁵ Ibid., p.26.

⁶ <http://www.futuremorph.org/>

⁷ Institute of Careers Guidance, Education Committee

⁸ National Advisory Council for Careers and Educational Guidance, 1996

⁹ Jenkins and Nelson, "Important but not for me: students' attitudes towards secondary school science in England", Research in Science & Technological Education, 23 (2005), 41-57.

¹⁰ Archer et al, "Doing science versus being a scientist: examining 10/11 year old schoolchildren's constructions of science through the lense of identity", Science Education, 94 (2010), 617-639.

¹¹ Greenbank and Hepworth, "Working class students and the career decision making-process", Edge Hill University, 2008.

“Cold’ knowledge (e.g. through documents, prospectuses, and new technologies like websites) does not sufficiently change patterns of educational choice, particularly for ‘working-class learners’, who tend to rely more on ‘hot’ knowledge, such as interpersonal relationships, particularly from known or trusted sources. For this group of learners especially, it is important to recognise the benefits that face-to-face guidance offers them in mapping out their education options and career choices.”¹²

10. It is therefore clear that awareness and education can support young people to access information but information alone is insufficient to guide young people to appropriate choices - advice and guidance are required, particularly for those lacking in social capital.

Timing of Careers AEIAG

11. If a poorly informed choice is made by a young person, they may then find at a later stage that the qualifications they have chosen close down potential career pathways. For example, for courses that start in Year 10 young people will be making choices that will determine their post-16 opportunities at a time when they are rarely well informed or ready to decide on career options. For some schools who start GCSE teaching in Year 9 key choices may be made even earlier and must therefore be pre-empted by appropriate AEIAG earlier in the education cycle.
12. Teachers can play an important role in regard to careers information and awareness; they are well placed as a source of ‘hot’ knowledge and can support careers awareness, integrating it in to their teaching through contextualised learning from an early stage. Teachers are able to draw down on a range of sources including those from the Science Council, its member bodies and the National STEM Centre to support their own awareness of the careers available from STEM qualifications. There are many careers focused enhancement and enrichment activities and resources available to teachers and the Science Council has been very active on this issue, particularly through the Careers from Science project and the Future Morph website.
13. The mix of Awareness, Education, Information, Advice and Guidance should be appropriate for the individual and the educational stage. As previously stated, face-to-face advice and guidance will be more important for some groups of individuals and consideration should also be given to the relative importance of the decision making stage. The transition to work or further education and training at the age of 18 can be a life influencing decision point and it is vital that young people are supported with good quality impartial guidance.
14. It is the Government’s stated policy to expand the provision of apprenticeships and vocational education through Further Education Institutions (FEIs). In 2009/10 there were nearly 1.1m learners in FE under the age of 19¹³. Further Education colleges will be a key route for many of those aiming for science technician careers and the Science Council therefore welcomes the extension of the careers duty to FEIs. To ensure that young people are fully aware of the career opportunities available to them through these institutions, schools’ careers guidance must include support for, and knowledge of, multiple progression routes, including technical pathways as a route into further and higher education and employment.

Quality

15. The government’s desire to grant schools and colleges greater freedom to set policies appropriate to their local needs must be balanced with adequate guidance and support, particularly funding support. The Science Council welcomes the use of the ‘matrix Standard’ to assure the quality of the National Careers Service and hopes that schools and colleges will consider this when purchasing services.
16. However, the Science Council is unclear as to how the Government proposes to ensure schools and colleges are adequately accountable for their careers provision. It is vital that provision is of an

¹² Archer et al, “*Doing science versus being a scientist*”, p.6.

¹³ The Data Service, “*Current SFR*”, http://www.thedataservice.org.uk/statistics/statisticalfirstrelease/sfr_current/, accessed July 2012.

appropriate level and also that the requirement for impartiality is met. Guidance must not be coloured by the institution's interests and, in addition, must be informed by the future skills needs of the UK's economy. This latter point is particularly pertinent for STEM subjects where there is often a deficit of careers awareness amongst young people and with a clear need for technician level science, engineering and technological skills¹⁴ it is also increasingly important to raise awareness of the non-HE routes in to STEM.

This response is submitted with the executive summary of the Science Council's "Current and Future UK Science Workforce" research report. This research is referenced above and illustrates the enormous breadth of careers available to young people through studying science. The Science Council would be happy to assist with any queries relating to this research or any other aspect of this consultation response.

The Science Council 31st July 2012

¹⁴ Cogent, September 2008, "Skills for Science Industries: Skills at Work."

**Member Bodies of the Science Council
July 2012**



1. Association for Clinical Biochemistry*
2. Association of Neurophysiological Scientists*
3. Association for Science Education**/ ***
4. British Academy of Audiology
5. British Association of Sport and Exercise Science
6. British Computer Society*
7. British Psychological Society*
8. British Society of Soil Scientists*
9. Chartered Institution of Water and Environmental Management*
10. College of Podiatry
11. Energy Institute*
12. Geological Society of London*
13. Institute of Biomedical Science*/ **
14. Institute of Brewing and Distilling*
15. Institute of Clinical Research*
16. Institute of Corrosion*
17. Institute of Food Science and Technology*/ **
18. Institute of Marine Engineering, Science and Technology*
19. Institute of Materials, Minerals and Mining*
20. Institute of Mathematics and its Applications*
21. Institute of Measurement and Control
22. Institute of Physics and Engineering in Medicine*/ **
23. Institute of Physics
24. Institute of Science and Technology**
25. Institution of Chemical Engineers*/ **
26. Institution of Environmental Sciences*
27. London Mathematical Society
28. Mineralogical Society*
29. Nuclear Institute*
30. Oil and Colour Chemists' Association*
31. Physiological Society
32. Royal Astronomical Society
33. Royal Meteorological Society
34. Royal Society of Chemistry*/ **
35. Royal Statistical Society*
36. Society for Cardiological Science and Technology
37. Society for General Microbiology
38. Society of Biology*/ **
39. Society of Dyers & Colourists

* Licensed to award Chartered Scientist (CSci)

** Licensed to award Registered Scientist (RSci) and Registered Science Technician (RSciTech)

*** Licensed to award Chartered Science Teacher (CSciTeach)