Careers Guidance for Young People Inquiry

House of Commons Education Committee
Science Council Evidence

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 Morph website[1] designed to provide information about career 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. The 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.

The role of careers guidance

4. The term career or careers guidance is used to cover a very wide range of activities from individually tailored advice delivered face-to-face, to the provision of pure information. Often accessing and assessing information or advice relies on an individual's awareness of their information needs, for example, knowing that there are different types of universities or several thousand different types of STEM university course, and that you may not necessarily need a degree to work in science. As with other areas of life, an informed consumer has the ability to make better use of the resources available.

5. In its 2010 report the Science and Society 'Science for Careers' Expert Group[3] considered the elements that contribute to and support decisions about careers, and the group developed the concept of 'careers awareness'. Increasing careers awareness is not only relevant to students: it plays a role in supporting the influencing environment around individuals (teachers, parents, peer groups) and broadens the base from which they can explore a wider range of career options. When added to the traditional elements this gives rise to Careers Awareness, Education, Information, Advice and Guidance (CAEIAG), it is important to understand the distinct role of each element, how they fit together and to consider which bodies and individuals are appropriate to deliver each :

6. **Awareness** of different employment sectors and the range of career options available generates the

[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/content/science-workforce, accessed July 2012
[3] BIS Science in Society Expert Group, Science for Careers 2010

interest to seek out information[4]. It will typically be led by external bodies and made available to schools careers providers and others. Examples include the Science Council's own Future Morph website[5] and the Talent 2030 initiative.[6]

7. **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]

8. **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]

9. Information would include leaflets about individual career paths as well as LMI. LMI can refer either to Labour Market Information (statistical data, trends and projections) or to Labour Market Intelligence (soft data, individual stories, retrospective, illustrative), usually broken down into sectors to avoid it becoming unwieldy and overwhelming. Generally 'intelligence' is generated through personal interaction, research and contextualization of this information. Sectors can be defined by occupation, business/industry, and geography or by workforce characteristics (graduate, non-graduate).

10. **Advice** requires more in-depth interaction with the client. It includes the explanation of information and explanations about how to access and use information.[9]

11. **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.[10]

12. Due to its specialist nature it is clear that guidance is best delivered by trained professionals. The new statutory duty requires schools to secure independent guidance; there should therefore be transparency with regard to the qualifications of individuals that schools commission to undertake this role.

13. Other elements of Careers AEIAG can be effectively delivered within the roles of other staff or external providers; in particular subject teachers can do much to raise awareness of careers through their teaching. For science and mathematics there are many resources to help teachers contextualise their teaching and to signpost to related careers information. The Science Council has worked with the National STEM Centre, the Centre for Science Education and its own member bodies to develop and raise awareness of such material.

14. Teachers have an opportunity to build a relationship with students and therefore will often be asked for information, advice and guidance. A recent survey of over 3,000 7-18 year olds by City and Guilds showed that 64% of 14-18 year olds had received careers IAG from their teacher.[11] However, the Times Education Supplement and Education and Employers Taskforce have found that 53% of teachers and school leaders surveyed were not confident about providing advice on apprenticeships[12]. It is inevitable that young people will seek information and advice from teachers and evident that support is necessary to enable those teachers to be impartial and well informed about all progression routes.

Appropriateness of Support

[4] Ibid., p.26.
[5] http://www.futuremorph.org/
[6] http://www.talent2030.org/
[7] Institute of Careers Guidance, Education Committee
[8] National Advisory Council for Careers and Educational Guidance, 1996
[9] Institute of Careers Guidance, Education Committee
[10] Ibid.
[11] City and Guilds, *"Ways in to Work"* May 2012
[12] http://www.tes.co.uk/article.aspx?storycode=6260004

15. The balance between the different elements of CAEIAG will need to be appropriate for the stage of education and respond to the needs of the pupil. For example, research has shown that stereotypes and self-identity in relation to science careers are well developed by the age of 11[13] and so at the primary stage it may be appropriate to introduce elements of careers awareness but not advice or guidance.

16. As young people progress through their education they reach key decision points. Some examples of key decision points are:
    - GCSE subject choice, particularly where the schools offer options from core science to studying three separate sciences
    - Decision to study vocational qualifications or apply to enter a University Technical College
    - Decision on post-16 courses, subject combinations, particularly the importance of mathematics choices and combinations of A levels and other post 16 qualifications
    - Selecting between the several thousand STEM degrees available[14]

17. Consideration of these decision points makes it clear that the level of support and advice for young people increases as they progress through school. It is also apparent that there is no 'one size fits all' approach to Careers AEIAG. Children and parents (as well as other influencers) will have varying levels of access to careers information and varying levels of background knowledge and experience. The need for specialist support often increases as young people and students begin to focus their options.

18. Research shows that the medium through which information is presented to young people across different social groups plays a significant role in shaping attitudes towards pursuing a career in science.[15]

> "'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."[16]

19. It is 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.

20. A good quality work experience placement such as one which includes project work and an opportunity for reflection on learning can provide a valuable insight to the world of work as well as raising awareness of the range of roles undertaken within any sector. However, schools report that science placements can be hard to source and too often are reliant on a personal contact which, again, disadvantages those lacking in social capital. A successful work experience programme and establishing and maximising the links with local employers should be integral to a schools' careers strategy and is likely to require support and co-ordination beyond the careers service provider.

Importance of Careers Information, Advice and Guidance for Science

21. Subject choices are particularly key for science as poor choices can cut off future options or leave young people ill equipped for higher education. For example, mathematics skills are important for social science courses and disciplines such as physics or engineering specifically require mathematics A level. In addition, many careers require a breadth of knowledge across all three sciences, therefore dropping one subject too early can close off options.

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[13] 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.
[14] *"Choosing the right STEM degree course"* University of Warwick commissioned by SCORE, Dec 2009
[15] Greenbank and Hepworth, "*Working class students and the career decision making-process*", Edge Hill University, 2008.
[16] Archer et al, "*Doing science versus being a scientist*", p.6.

22. Many science disciplines which are taught at university are not visible in schools and are not taught in their own right at that stage of education. An example would be geosciences where elements appear in the sciences or geography but very few schools teach geology as a standalone subject. To some extent this is also true for specialist branches of science, such as molecular biology or biochemistry. It is particularly important for these subjects that young people have access to advice from well informed careers professionals who can supplement information from science teachers, who cannot be expected to be knowledgeable about courses in all areas of science. The Science Council member bodies provide a wealth of information that can support both teachers and careers professionals.

23. In the same way that science A levels are seen as 'facilitating subjects'[17] so science degrees provide transferable skills valuable to employers. Young people are often unaware that studying STEM subjects can develop transferable skills such as problem solving, data assessment and analysis, and high levels of numeracy and information technology skills. Having a degree in physics, chemistry, biology, natural sciences or mathematics does not automatically create a physicist, chemist, biologist, natural scientist or mathematician in a career or professional sense and is no more 'vocational' than a history, anthropology, classics, a language or philosophy degree. While those who wish to enter research careers in these areas are likely to require a specialist degree in the subject, for the most part the preparation will be good grounding for a very wide range of both science and non science career options. This message needs to come through the careers information, advice and guidance that young people encounter.

Monitoring and Accountability

24. 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 appropriate level of skill and experience and also that the requirement for impartiality is met.

25. The Science Council supports strongly the principle that guidance must not be shaped 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 skills it is also increasingly important to raise awareness of the non-HE routes in to STEM. [18]

26. Ofsted's thematic review to look at careers advice in summer 2013 is a positive step and we look forward to further details of the review's scope. There is potential for Ofsted to play a greater role through extending the remit of their ongoing inspections to include careers AEIAG provision. This could include assessing aspects such as the qualifications of those providing careers support, the breadth of resources available to users and whether use is evaluated.

27. It is possible to monitor the action that schools take for careers AEIAG but more difficult to monitor the impact of this activity on career path choices. For science there is a wide range of activities that can provide a positive contribution to careers AEIAG. The list below gives some examples and the Science Council would be happy to provide further information regarding specific examples including reasoning as to why these have been identified as positive activities:

    - Continuing professional development for subject teachers and careers advisers
    - Trips and visits
    - Engaging parents with school activities
    - Interactions with professionals and employers, either through practical activities, talks or presentations for pupils
    - Project work that illustrates the application of school science topics to the workplace
    - Individual visits and consultations – internal and external providers
    - Work experience opportunities and world of work opportunities
    - Pilot longitudinal studies

[17] Informed Choices, Russell Group http://www.russellgroup.ac.uk/informed-choices.aspx
[18] Cogent, September 2008, "Skills for Science Industries: Skills at Work."

- Parent and pupil feedback/evaluation

The Science Council is pleased that the Committee is looking at the important issue of careers guidance and hope that this input is helpful, we would be happy to discuss further any of the issues outlined above.

The Science Council 31st August 2012

Member Bodies of the Science Council
August 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)