CONSULTATION RESPONSE

wellcome trust

DIUS: High Level Skills

Response by the Wellcome Trust

June 2008

1. The Wellcome Trust is the largest charity in the UK. It funds innovative biomedical research, in the UK and internationally, spending over £600 million each year to support the brightest scientists with the best ideas. The Wellcome Trust supports public debate about biomedical research and its impact on health and wellbeing.
2. Much of the Trust's funding in the UK is provided through universities, and the Trust directly supports the development of higher level skills through a range of innovative PhD programmes and studentships, and undergraduate scholarships.
3. The Wellcome Trust is also committed to engaging the public with science and research. As part of this public engagement work, our education programme sets out to stimulate interest and excitement in biomedical science amongst young people, increase the quality of young people entering biomedical related careers and support scientific literacy more broadly.
4. We welcome the proposals for a skills framework and the attention that DIUS is giving to improving skills. We encourage DIUS to work closely across Government, and particularly with the Department for Children, Schools and Families and the Department for Business, Enterprise and Regulatory Reform, to ensure the successful implementation of the framework, given the significance of key stage 3 learning and employer engagement.
5. This response provides some general points about encouraging the study of STEM subjects and improving employer engagement, rather than answering specific questions posed in the consultation. While the consultation document does not explicitly address higher level skills, we would encourage DIUS to ensure that PhD and postgraduate level skills are included in the development of any skills framework. Our response therefore also encompasses these higher level STEM skills.

Encouraging students to study STEM subjects

6. Enhancing the uptake of STEM subjects is key in order for the UK to maintain a healthy and competitive science research base. We suggest there are three ways to encourage students to study STEM subjects: by providing inspiring lessons, improving the quality of careers advice, and ensuring PhD training remains an attractive option.

    - **Providing inspirational lessons**

7. The key to ensuring successful student engagement with science is inspirational science teaching – by teachers who are up-to-date and confident in their subject. Continual improvement of the quality of science teaching at school must underpin any skills strategy. The national and regional Science Learning Centres offer the potential to deliver appropriately tailored continuing professional development (CPD) to science teachers, and we argue that increasing teacher access to these Centres is essential.
8. The Wellcome Trust is the founding partner of Enthuse, a £30 million partnership between the Trust, Government and industry, which aims to establish a step change in the take-up and

attitude towards CPD by teachers. The initiative was announced in Budget 2008, and will be formally launched on 8 July at a London school. Enthuse provides bursaries for travel and lesson cover, allowing teachers to attend intensive, high quality residential courses at the National Science Learning Centre.

9. A healthy supply of high calibre STEM graduates into the teaching profession is also essential to provide role models and inspire students at school, and the Trust supports initiatives such as Teach First that aim to encourage this.

10. The Trust emphasises the importance of hands-on science and practical activities as a tool for engaging students, and supports the Department for Children, Schools and Families focus on this area. The significance of practical skills has been highlighted in reports such as the 2005 Biosciences Federation report, *Enthusing the next generation,* and the 2005 NESTA report, *Real Science – Encouraging experimentation and investigation in school science learning.*

- **Improving careers advice**

11. High quality careers advice is also essential to provide students with information about the range of opportunities presented by STEM training.

12. The consultation document outlines an aim to encourage STEM graduates to work in the area of their training. Although this is important, we also recognise that the broad-base investigative and analytical skills acquired during STEM training are important in many sectors, for example service industries such as banking, and suggest that STEM graduates can make a vital contribution to the economy beyond the STEM sector.

13. The Science Council is launching a careers information website in September 2008, 'FutureMorph', which will target younger students aged 11-19 and provide information on the benefits of studying science and technology. The information provided will reflect wide and varied careers in both STEM and non-STEM sectors. Efforts such as this could help improve recruitment of students to science higher education.

14. In order to enhance career advice available for researchers and students in higher education, the Trust, in partnership with RCUK Research Careers and Diversity Unit and the Royal Society, is taking forward a project to develop a web-based research career mapping tool. The tool will provide information on: the range of jobs on offer; skills and qualities needed; how to demonstrate one's qualifications; and what candidates need to do in order to be effective in their jobs.

15. It is also important to build an evidence base on reasons why students make their subject choices. The Trust has recently commissioned a systematic review: 'Factors affecting young people's school subject choices at age 13-14'. This review will identify and scrutinise international research evidence from the past ten years, and will particularly consider the factors affecting STEM choices. The study aims to assess the influence of 'internal' and 'external' factors – for example motivation and capabilities, role models, future career plans, future university plans, parental involvement, socio-economic constraints, demography, and family relationships. This review is due to be complete in March 2009 and we would be happy to share the outcomes with DIUS.

- **Ensuring the attractiveness of PhD training and academic careers**

16. PhD science training must be seen as an attractive option to the brightest students, if they are to consider taking STEM subjects. The Trust supports the Researchers in Residence programme which places PhD and post doctoral researchers in secondary schools, raising student aspirations and giving them the opportunity to engage with contemporary research.

17. Improving academic salaries and career structure could also improve UK PhD student recruitment and retention. Over the last few years, the Government has set out its intentions in this regard in *Science and Innovation Investment Framework 2004-2014,* the follow-up

document, *Next Steps,* and the White Paper *Innovation Nation*. It is vital that the recommendations from these publications are taken forward, and that their impact on the uptake and completion of STEM PhDs is monitored.

18. The Trust has been an innovative funder in this area; initiatives such as the Four-Year PhD Programmes, the provision of student stipends that are based on graduate research assistant salaries after tax, and realistic research costs have helped to transform the graduate experience.

Employer involvement in a Skills Strategy

19. The consultation document recognises the crucial role of employers in delivering the proposed skills framework. To ensure employers are fully engaged, it will be important to improve collaborations both with schools and universities. Clear mechanisms are required to ensure that the skills needs identified by employers are translated into provision of appropriate STEM training.

- **Improving links with schools**

20. Enthuse, described above, will increase direct interaction between employers and schools, as teachers will be able to nominate high potential A-level science students for internships with participating businesses. This is a clear example of business investment and active participation in education, where there is recognition that industry will eventually benefit from the skills that students develop during these placements. An important aspect of this project is that it presents a 'united way' for multiple stakeholders to work together to achieve common goals through partnership. The Trust suggests that there is potential for more collaborative internship schemes based on the Enthuse model.

- **Improving links with Universities**

21. Work placement opportunities should continue to be available to those in higher education. For example, the Wellcome Trust funds Vacation Scholarships that provide promising undergraduates with hands-on experience of research during the summer vacation with the aim of encouraging them to consider a career in research.

22. It may also be necessary to provide incentives to encourage academics to engage with industry. Important research-related activity in universities - including applied research, policy work, public engagement, and links with industry - cannot be adequately captured through the proposed new Research Excellence Framework (REF). The Trust therefore responded to HEFCE's consultation, encouraging HEFCE to consider how such research-related activities, which are vital to sustaining research quality, can be incentivised in conjunction with the REF.

- **Addressing employer's STEM skills needs**

23. Whilst there is little evidence for shortages in the supply of STEM graduates in the UK, employers are clearly articulating their specific STEM skills needs in certain sectors. Good examples of defined employer need include the 2007 ABPI/Biosciences Federation report entitled *In vivo sciences in the UK: sustaining the supply of skills in the 21st century*[1], and the ABPI STEM Education and skills taskforce report *Sustaining the skills pipeline*, which is currently being reviewed and updated. The Trust encourages DIUS to take forward the outcomes of such skills reviews, and to develop mechanisms to address the STEM skills needs that are identified by employers.

[1] This report is available to download at http://www.abpi.org.uk/Details.asp?ProductID=325