

BBSRC STRATEGIC FRAMEWORK FOR INDUSTRIAL TRAINING

PURPOSE

1. BBSRC recognises the on-going need for the people we support to have the skills and understanding to contribute to research and development within an industrial context, in support of UK economic growth. This strategic framework describes what 'industrial training means' to BBSRC, the drivers and barriers for this training, and presents a high-level framework for industrial training to ensure that BBSRC's support can be targeted effectively at all career levels. BBSRC intends to use this framework to:
 - a. develop its funded staff and students both as scientists and as researchers;
 - b. prepare individuals for a breadth of careers;
 - c. inform its programme development;
 - d. influence its partners and stakeholders.

VISION

2. BBSRC's vision is for all its funded researchers to have the expertise and ability to work effectively and collaboratively in partnership with industry. This will ensure a two-way movement of knowledge, skills, ideas and people between the academy and research-using industries for mutual advantage and for the benefit of the UK academic research base and the wider UK economy.

INTRODUCTION

What does BBSRC mean by industrial training?

3. Industrial training, in a BBSRC context, is the development of researchers in connection with the private sector. Charity, academic and other sectors are not included. The definition can be more clearly defined by splitting it into three distinct yet related components:
 - **Training *with* industry**

This is collaborative training of people in research focused around industrially-relevant techniques and topics based either in an academic or industrial setting. It includes training that industry can uniquely provide such as that required for using certain facilities
 - **Training *about* industry**

This is training in transferable skills that are uniquely or significantly required by industry, for example commercial awareness, entrepreneurship and communication skills. It also includes learning about the different research environments provided by industry compared to academia.
 - **Training *for* industry**

This is training designed in consultation with industry to increase the research skills of people employed within particular sectors.

Why does BBSRC support industrial training?

4. The UK research base is one of the most productive in the world, second only to the United States of America in quality output and first for life sciences¹. This quality attracts inward investment from large companies and supports a vibrant SME community of research-intensive or research-using companies: there are more than 4000 life science companies with a UK presence, employing 165,000 people within the UK and with a turnover of over £50Bn (2011/12 figures)². The public investment in supporting collaborative research made by BBSRC, other Research Councils and the Technology Strategy Board has helped cement these relationships. However, it is through ensuring a supply of highly qualified and highly knowledgeable people with a flexible approach to their career and possessing the skills and expertise required by industrial employers that will maintain the UK's competitiveness in a knowledge-based economy.
5. BBSRC's role is not only in supporting excellent research at UK universities and research institutes, it also has an important role in supporting the training of people for a career in research (either in the public or private sector), or for careers outside of research in the wider UK, and international, economy.
6. It is accepted that, in a competitive global market and the perceived lack of career potential in academia³, doctoral graduates and other research staff will have increasingly diverse careers requiring a breadth of skills and expertise encompassing: advanced technical and analytical skills; inter- and multidisciplinary working across organisational hierarchies and value chains; transferable skills such as entrepreneurial/enterprise awareness, project management, additional languages and communication skills.

Approach

7. In developing this strategic framework, BBSRC has sought input and advice from a number of sources. These include:
 - Strategy Advisory Panels (formal structures within the BBSRC organisation) responsible for Industrial and Training advice⁴
 - A workshop held on 6 June 2013 of approximately 35 invited senior delegates from across academic and private sector research-intensive organisations; **Annex 1** provides a report from this workshop.
 - BBSRC's main training partners, including our academic Doctoral Training Partnerships and Industrial CASE Partners
 - Review of existing literature, reports and data,
 - Employer organisations and Sector Skills Councils
8. This strategic framework is complementary to other BBSRC sector strategies, including BBSRC's Business Interaction Strategy⁵ and policy for Knowledge Exchange and

¹ International Comparative Performance of the UK Research Base 2011, HM Government/Elsevier
<http://www.bis.gov.uk/assets/biscore/science/docs/i/11-p123-international-comparative-performance-uk-research-base-2011.pdf>

² Strategy for UK Life Sciences, HM Government, 2011
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32457/11-1429-strategy-for-uk-life-sciences.pdf

³ 'What Do Researchers Do? Career Paths of Doctoral Graduates 2011', Vitae®
http://www.vitae.ac.uk/CMS/files/upload/Vitae_What_do_researchers_do_Career_paths_2011.pdf

⁴ The Bioscience Skills and Careers Strategy Advisory Panel is leading on providing guidance into this strategy, with significant input from the Bioscience for Industry Strategy Advisory Panel

⁵ www.bbsrc.ac.uk/web/FILES/Strategies/business-interaction-strategy.pdf

Commercialisation⁶, and provides a framework upon which future interventions and mechanisms to support industrial training can be based.

DRIVERS FOR INDUSTRIAL TRAINING

9. Industrial training cannot solely be about transferable skills and knowledge, although this is of course a key element; it has to be recognised that these skills and the knowledge/expertise have to be applied to real-world challenges. Thus, a key driver for the provision of industrial training is to establish, increase and embed collaboration between the academic and private sector research base. This is mutually beneficial: industrial challenges have increased visibility to a wider group of experts, and industrialists have access to the UK's world-leading academic researchers for cutting edge scientific knowledge and technical know-how; academic teams increase their awareness of real-world applications of their research and have access to facilities absent from standard academic laboratories. All of this knowledge, expertise and material transfer between industry and academia has the potential to seed new ideas and research challenges, to increase formal collaborative working and allow the easy flow of people between the two sectors.
10. Other research sector drivers for supporting industrial training include financial drivers: increased collaborative working has the potential to access other funding streams. For industry, this means access to public sector investment through collaborative research projects or studentships. For academia, this means the potential of obtaining private sector funding for projects, or leveraging of public funding through cash or in-kind contributions to applied projects. For funders too, this leveraging between public and private investment increases efficiency and can demonstrate the effective use of public funds to support UK industry.
11. There is a broader public good in supporting industrial training. The private sector overall employs 80% of all workers in the UK⁷. The private sector is the key driver for economic diversification and growth⁸, but in order to achieve this, it needs a supply of qualified and knowledgeable people with ambition, drive, enthusiasm and the right skills to be flexible in order to meet the challenges of a dynamic and changing economy. Academia can provide both a rigorous intellectual programme of technical learning, as well as offering training in transferable skills; collaboration between academics and industrialists should increase efficiency by avoiding duplication and ensuring that the training being offering is appropriate to the needs of both.
12. Increased training and skills provision within an industrial context will help academic researchers at all stages of their careers to recognise the value of collaboration with industry. In an economic context whereby a 'career for life' is no longer the norm, where a 'portfolio career' spanning and traversing the public, private and third sectors is more likely, a flexible workforce with the right skillsets is required.

BARRIERS TO INDUSTRIAL TRAINING

13. Nevertheless, there are a number of barriers to effective industrial training, which BBSRC needs to be aware of when exploring future activities in this area. First and foremost is the recognition that the cultures of research-intensive or research-using

⁶ www.bbsrc.ac.uk/web/FILES/Policies/knowledge-exchange-commercialisation-policy.pdf

⁷ Statistical bulletin: Public Sector Employment, Q1 2013, Office of National Statistics
http://www.ons.gov.uk/ons/dcp171778_314151.pdf

⁸ Report from the International Monetary Fund on UK Economic Growth and Stability, May 2013
<http://www.imf.org/external/np/ms/2013/052213.htm>

private sector companies are significantly different to those of traditional academia. Human resource structures within the private sector which recognise and reward entrepreneurship, team-working, and risk-taking are very different to those within academia, which focus on the academic outputs of individuals/small teams as part of the Research Evaluation Framework (REF).

14. An effective mechanism to break down cultural barriers is through the movement of people, knowledge and ideas between sectors. However, this is a challenge due to the very different environments which academic and industrial researchers inhabit. Short-term exchanges are problematic due to the time-lag required to set up new strands of research, and other logistics (for example, an academic wishing to undertake an exchange to industry would not be in a position to publish for a significant period of time, thereby reducing their ability to contribute high quality REF submissions and putting their future career at risk. Similarly, an industrialist moving to academia will not be contributing to the goals and targets of their employer, again putting future promotions at risk).
15. Time, or lack thereof, is a critical factor in establishing and maintaining research and training collaborations; without a significant investment in time and effort from both sides, the collaborative activity will not be maximally effective. The timescales of academic activities, the so-called 'grant lag' between submitting a project and getting funded, is an issue for both research and training activities. For example, doctoral project proposals are developed 18 months before a student commences a project; during this time lag, company priorities change, or in the worst case, the industrial partner ceases to operate.
16. Similarly, for many in the private sector, the structure and length of a traditional PhD is a hindrance to engaging. Other, more industrially-focused doctoral programmes, such as those run by EPSRC in the UK⁹, or in Denmark¹⁰, are held up as exemplars of a creative and flexible approach to industrially-relevant doctoral activities.
17. Finally, there is a capacity issue around the ability of private sector enterprises to undertake or support training. This is particularly the case with small or medium sized enterprises which may have a limited number of scientific staff suitably qualified and experienced to act as hosts or supervisors, and who already find themselves managing large programmes of work directly related to the future commercial success of their company. Training, mentorship and supervision may not be core priorities for such people, and a burden on the company and its resources.
18. All of these barriers impact upon the number of companies wishing to be involved in industrial training.

FRAMEWORK FOR INDUSTRIAL TRAINING

19. Recognising the drivers and barriers to industrial training, BBSRC has developed a framework upon which current and future investment strategies will be based.

A. Industrial training should encourage and drive culture change in industry and academia though trained people

Workplace cultures can differ between research-intensive and research-using private sector companies and traditional academic environments. BBSRC should

⁹ <http://www.epsrc.ac.uk/skills/students/centres/current/Pages/indd.aspx>

¹⁰ <http://fivu.dk/en/research-and-innovation/funding-programmes-for-research-and-innovation/find-danish-funding-programmes/postgraduates-in-the-private-sector/industrial-phd/>

aim to break down cultural barriers by encouraging collaboration and movement of people, knowledge and ideas between sectors.

B. Industrial training should complement other forms of training that BBSRC supports.

The key output from BBSRC training is the scientifically, technically and analytically-trained people needed for careers in research or elsewhere. However, skills such as business acumen, team-working and negotiating are important in the development of researchers and BBSRC should explore creative ways in which this generic training can be delivered effectively and efficiently. The training should reflect the international nature of global research (in public or private sector organisations) and the skills gained should be readily applied to real-world challenges. BBSRC should strive not to duplicate existing efforts by other training providers.

C. Industrial training should recognise the value of interventions at all career stages

All career stages – from undergraduate to established researchers and within academic or industrial settings – should be considered for industrial training. BBSRC is mindful that different approaches may be required to achieve impact at different intervention points.

D. Industrial training should be responsive to the needs of different-sized companies and industrial sectors, as well as to the needs of individuals at different career stages

Industrial training should be demand-led and sufficiently flexible to accommodate the diverse needs of companies of different sizes and from different sectors, and recognise that the training and development needs of individuals differs based on their employer, sector and stage of their career. BBSRC must aim to be more rapid in response to industrial training requests.

E. Industrial training should be delivered through multi-lateral partnerships with academia and industry.

A key driver for the provision of industrial training should be to establish, increase and embed mutually-beneficial research and training collaborations between BBSRC, other research funders, industry and academia. BBSRC should maintain an open dialogue with user communities to ensure that timely and up-to-date advice continues to shape the framework.

F. BBSRC's approach to industrial training should recognise the importance of ensuring communication with key stakeholders for maximum dissemination.

A communications strategy aimed at stimulating the uptake and dissemination of BBSRC's industrial training programmes (particularly amongst SMEs), should be developed, taking full advantage of extant networks where appropriate.

G. The outcomes and impacts arising from industrial training should be captured in order to inform good practice

Through post-award engagement, BBSRC should capture outcomes and impacts arising from the training so as to inform best practice, stimulate case studies and stimulate interest in, and uptake of, the training and reduce confusion, duplication or wasted effort.