

Research Council Support for Knowledge Transfer

An Institute of Physics response to a
House of Commons Science and
Technology Committee Inquiry

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submissions to consultations can be found
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16 February 2006

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Clerk to the Committee
Science and Technology Committee
House of Commons
7 Millbank
London SW1P 3JA

Institute *of* Physics

Dear Sir/Madam

Research Council Support for Knowledge Transfer

The Institute of Physics is a scientific membership organisation devoted to increasing the understanding and application of physics. It has an extensive worldwide membership (currently over 35,000) and is a leading communicator of physics with all audiences from specialists through government to the general public.

The Institute welcomes the opportunity to respond to the House of Commons Science and Technology Committee's Inquiry into Research Council Support for Knowledge Transfer.

General Principles of Knowledge Transfer Processes

The Institute aims to strengthen and support the health of physics based enterprises, in particular by promoting and facilitating innovation. The Institute operates its own knowledge transfer networks (the emerging technology programmes in nanotechnology, biotechnology and optics) with meetings often run in collaboration with Research Councils.

The Institute believes that knowledge transfer processes should follow a number of general principles. They should:

- Focus on stimulating and supporting demand pull rather than technology push. Demand-pull is crucial for effective knowledge transfer and should permeate all components of the knowledge transfer process.
- Focus on impact rather than activity per se. It is vital to build up a strong evidence base of what mechanisms have the most impact and in what circumstances.
- Be systemised and embedded in the culture of research departments and business R&D by linking directly to knowledge transfer metrics influencing assessment criteria.

In addition, the Institute is of the view that:

- Mechanisms for collaboration must recognise the significantly different timescales to which industry and academia usually work.
- Intermediary bodies (e.g. Research & Technology Organisations, professional Institutes and knowledge transfer agencies) can play an important role in helping to reconcile the fundamentally different goals and objectives of academia and industry (e.g. the quest for knowledge vs. economic growth), by bringing the relevant people together. However, they must not be seen as a replacement for direct interaction.
- Intellectual Property needs to be managed sensibly by recognising that it is best owned and managed by the exploiting party, while ensuring that collaborating parties receive appropriate rights and returns that reflect their contributions.
- People-based schemes such as placements and secondments are an effective mechanism for knowledge transfer that could be more widely supported.
- Co-ordination across Research Councils is important and should extend to working with government departments so that all publicly-funded research reflects a coherent national strategy, rather than the fragmented set of strategies that we have at present.
- Care must be taken to ensure that any potential strategy is not directive, stifling innovation in research at birth.
- Within a competitive and global market for research, industry will place contracts according to where it can get the greatest value for money. The move to full economic costing in the science base may not be helpful to the UK if it used rigidly to set the price for work by academia for industry.

Research Council Support for Knowledge Transfer

The basic principle of funding universities to support knowledge transfer is excellent. An international panel of scientists, who recently undertook a review of the quality of UK physics and astronomy research, noted that the Research Councils have been promoting knowledge and technology transfer through their knowledge transfer schemes, and have many success stories such as the 'Cambridge' phenomena (e.g. Cambridge Display Technology) and within the SUPA collaboration. The international panel suggested that 'UK plc' would greatly benefit by having similar schemes throughout the country.

The recent statement made by the chief executive of PPARC to the Committee about PPARC requiring most grant applicants to provide plans for knowledge transfer activities, is a welcome development, and it is hoped that the other Research Councils will follow suit.

Specific Areas of Concern

There are a number of concerns that need to be addressed:

- **Stimulating Market Pull.** Knowledge transfer involves two bodies: the initiator and the receiver of that knowledge (as a simplification as the relationship is often more complex in practise). The Research Councils have struggled to get the initiators to make serious efforts at such transfer, and have no control over the intended recipients (usually industry). It is becoming increasingly rare for industry (except some of the very large multinationals) to have scientific staff with the experience and judgement to act as recipients, or even to decide what their needs are. The very poor record of research funding in UK industry is an illustration of this trend. The collapse of the large laboratories (whether government or industry) has made things worse.

There is too much encouragement of technology push and not enough user pull at the start of research. This leads to scattered and fragmented activity without significant and complete outcomes. Users have their own priorities and will only respond to academic demands when there is mutual benefit and recognition. At present, collaboration happens more by chance than any strategic plan.

- **Distinguishing between applied and blue sky research.** It is important to recognise and support distinct funding streams for application of research and really innovative research where there is no application envisaged. At present there are attempts to show industry relevance for almost everything which can lead to weak and ineffective links across the board. Strong coupling where there is true benefit likely and no attempt to couple really original investigations would be more effective.
- **Acknowledging priorities.** The use of the term 'third stream' funding for knowledge transfer activities unfortunately reflects the view held by many universities on the relative priority and value of knowledge transfer activities compared to research and teaching. If knowledge transfer is to happen as a priority then alternative terminology to describe the different funding streams may be helpful.
- **Nurturing Relationships.** Improving management of expectations on both sides of the industry-academia interface are essential. Industry must be made aware that there are no researchers sitting around ready to do small, short term, projects. It is impossible to respond on the timescale expected in industry. Academics must realise that research in industry is more like development. The Research Councils could take a more systematically proactive role in supporting and nurturing these relationships.
- **Co-ordinated National Strategy.** The Research Councils need to identify strategic national user needs (with other stakeholders), and focus funding to achieve significant nationally relevant outcomes. The Technology Strategy Board has made a good start in this direction in its first year, but there is much more that can be done.
- **Effective Dissemination.** The Research Councils must add value by identifying and promoting integrated results of their investment. Research Council communication is limited at present – they need to evaluate, integrate and communicate the value of what they support through grants. Too much is left to the universities.
- **Centres of Expertise.** The Research Councils need to concentrate on and grow a small number of very much larger 'centres' of expertise – current fragmented

funding of small projects leads to numerous sub-critical units that are not visible and competitive by international standards; the competition is global and not between UK universities.

- **Training.** New approaches need to be developed and Research Council and university staff need training – one cannot expect efficient knowledge transfer to just "occur on demand" if individuals are doing it untutored by trial and error.
- **Transferring People.** The transfer of people is the most effective mechanism for knowledge transfer. This should involve young students and recent graduates as well as operating between experienced Research Council staff, researchers and industrialists. Access to people-based schemes for companies of all sizes and sectors could be improved.
- **Remove cap on the Follow-on Fund.** The Research Council Follow-on Fund has been very successful in attracting good proof-of-concept proposals for initial funding to take research outputs to commercial propositions. There should be up to two calls per year and the financial cap on total proposal value from any university should be removed (EPSRC are the only Research Council to have such a cap).
- **Extended CRD Programme.** Collaborative Research & Development (CRD) projects are very valuable but restricted because of their focus on specific programme areas and their short term nature. There should be a general CRD programme capable of supporting collaborative research in any area over long time periods.
- **Knowledge Transfer Metrics.** Increased use of knowledge transfer metrics when assessing funding proposals would be welcomed. This should be combined, where appropriate, with more emphasis on post project reviews of successful exploitation activities. Success criteria should focus on meeting "market need". However, care must be taken not to take such an approach to extremes and restrict creative blue skies research that questions commonly held beliefs. Distinctions may need to be made between R&D themes during assessments.
- **Engaging SMEs.** For small and medium sized companies it can be difficult to engage universities in collaborative high risk innovation projects. To this end there could be improved co-ordination of linked projects within the Research Councils together with better integration between the strategies of the Research Councils and government departments. More joint funding of long-term industry-led projects would be advantageous.

If you have any queries, please contact me or my colleague Dr Paul Danielsen at the Institute.

Yours faithfully

Dr Robert Kirby-Harris CPhys FInstP
Chief Executive

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