

ACTIVITIES AND ACHIEVEMENTS QUESTIONNAIRE

1. NON-TECHNICAL SUMMARY

A 1000 word (maximum) summary of the main research results, in non-technical language, should be provided below. The summary might be used by ESRC to publicise the research. It should cover the aims and objectives of the project, main research results and significant academic achievements, dissemination activities and potential or actual impacts on policy and practice.

There has been an increasing focus on the role that universities can play in contributing to innovation, productivity, and economic and social welfare. In addition to the important core missions of research and teaching, both research and policy has focused on 'technology transfer' concentrating on the process of the commercialisation of science through such mechanisms as patents, licences and spin-outs. As this research shows, these mechanisms are important, but as it also shows, they are an incomplete representation of the wide process of knowledge exchange that takes place between academics from all disciplines with partners in the private, public and the so-called third sector (which includes charities, voluntary organisations and social enterprises).

This research adopted a multi-method approach to shed light on the factors that affect the incidence, form, effectiveness and regional impact of knowledge exchange activities between the business and higher education sectors in the UK. The project analysed both supply push (from academia) and demand pull (from businesses and other organisation) factors and evaluated the 'public space' role of universities. The project used case studies and two large scale surveys – including a survey of academics which generated more than 22,000 responses and survey of businesses which generated more than 2500 responses.

The research identified and quantified the wide range of interactions between academia and business (and other organisations). Patterns of interaction were grouped into four broad categories: technology transfer, people based, problem solving and community based. Technology transfer is amongst the least common form of external knowledge exchange activity compared to the much wider and more frequently reported people-based, problem-solving and community based interactions.

The development of effective partnerships is crucial if knowledge exchange is to be effective and provide benefits to all partners. Partnerships emerge and evolve through a range of different and contrasting ways. The case study research identified the importance of intermediaries or 'boundary spanners' who initiate, facilitate and manage contractual and relational interactions. The survey of academics showed that the most frequently cited initiator were individuals associated with the external organisation and the least frequently cited initiator was the University Technology Transfer Office (TTO). Similarly, the survey of businesses showed the actions of the firm were the most important mechanism for initiating relationships.

As far as businesses are concerned the motivations to interact are not restricted to technology development but also include service development, human resource management, training and marketing. This is important as much analysis and policy has

focussed on the role that universities and academics play in the technology aspects of the innovation system but many of the motivations of business to interact with academics are concerned with other aspects of management and business performance. As far as academics are concerned, the survey shows that they engage with businesses to support their research and teaching activities.

There are several methods in which companies evaluate the success of their interactions with academia, ranging from informal or subjective measures, to formal metrics-based approaches. The result from the business survey show that the most widely form of metric is 'qualitative information' such as unexpected by-products of interactions and learning experience. Other metrics used, in descending order of importance, are measures related to wider business objectives, technical objectives and investment objectives.

In terms of impacts, the business survey showed that third of collaborating firms in the survey believed that interactions with universities has a significant impact on the firms' activities with slightly more than a quarter believing that the interactions had little or no impact. The survey of academics shows that interactions with external organisations had significant positive impacts on research and teaching.

There are a range of constraints that prevent or deter interactions. The results from the business survey show that the major constraints are lack of resources to manage interactions; lack of public policy programmes to encourage interactions; difficulty in identifying partners; and insufficient benefits from interactions. It is commonly argued that there are cultural barriers (because universities are different to business) and problems with intellectual property are major constraints. But these are not frequently cited by firms or by academics. The survey of academics shows that academia identifies a similar pattern of constraints, the most important are: a lack of time, bureaucracy and insufficient rewards.

Interactions operate across different geographies - there is no one dominant geographical domain that encompasses the knowledge exchange process. There is frequently a trade-off between the need for regular personal interactions which tends to generate preferences for proximity and local connections; and the need to highly specific knowledge or expertise which may require links connections with very distant partners. There are, however, some important contrasts between different forms of knowledge exchange: in general, people-based interactions are more likely to be local compared to problem-based interactions.

The project has generated significant interest from the academic and policy communities. In addition to the academic papers that are currently in progress, and which will be submitted to leading international journals, the project has produced two unique large scale datasets which will be of considerable interest to the academic community and two substantive published reports. The dissemination of the findings has been widespread with a range of presentations to academics, businesses and the policy community both in the UK and overseas (see Research Report).

A number of policy issues arise. Universities have different strengths and that they will have different impacts on local and regional development. There are many barriers to collaborations, and those that are particularly important include lack of information or lack of capacity to engage (including time and people). The research shows the

importance of 'boundary spanners' - people who can connect businesses (and other institutions) to academia. In terms of the spatial dimensions, the research shows the multiple geographies of interactions. This suggests the danger of focussing on single spatial scales for the construction and implementation of policy. It is important to build 'connective capacity' and networks that promote knowledge exchange but such networks should not be constrained to a predetermined geography or administrative boundary.