

December

01/68

Research report

Higher education- business interaction survey

**A report by the Centre for Urban and
Regional Development Studies,
University of Newcastle upon Tyne**

Higher Education-Business Interaction Survey

**A report to the UK HE funding bodies
(HEFCE, SHEFC, HEFCW and DEL)
and the Office of Science and Technology**

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December 2001

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The survey and this report were commissioned by the Higher Education Funding Council for England on behalf of a wider group of stakeholders, including the Department of Trade and Industry/Office of Science and Technology (DTI/OST), the Department for Education and Skills (DfES), and the other UK higher education funding bodies. The survey and report were produced by CURDS and the conclusions and recommendations are those of the authors.

Acknowledgements

The authors would like to acknowledge the input of Lynne Humphries as research assistant on this project, notably in contacting HEIs concerning the costs and difficulties of completing the questionnaire and encouraging responses. Also Antigone Tsappis provided secretarial assistance during early stages of the project.

The project was supported by a Steering Group consisting of:

Adrian Hill, HEFCE

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Hugh McAloon, Scottish Executive

With additional inputs from Robin Jackson of Universities UK

Adrian Hill oversaw the project with skill, tact and patience and we would like to express our particular thanks to him.

Finally we would like to thank all of the staff in HEIs that have laboured to complete the questionnaires, especially when faced with other demands for information.

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Executive summary

Purpose and design of the survey

This report provides the analysis of a survey commissioned by the Higher Education Funding Council for England (HEFCE) on behalf of a wider group of stakeholders including the Department of Trade and Industry/Office of Science and Technology (DTI/OST), the Department for Education and Skills (DfES) and the other UK higher education funding bodies.

The survey had four main objectives:

- To update previous surveys of interactions between higher education (HE) and business covering the whole of the UK; and to capture the key outputs of such interactions, taking into account differing institutional missions, strategies, capacities and expertise.
- To quantify a UK baseline for the significant level of activity which has developed in higher education institutions (HEIs), and from which improvements in later years could be measured.
- To establish and test the robustness of selected indicators which might later inform decisions on further targeted funding for knowledge transfer activities.
- To assess the opportunity costs of an annual survey against the value and utility of the data collected.

Previous surveys were carried out in the mid to late 1990s by Tartan Technology and by Policy Research on Engineering, Science and Technology (PREST) at the University of Manchester. The last of these related to the academic year 1996/97, whilst the current survey updates this to 1999/2000.

Since the last survey, significant additional government support has been provided across the UK for HE-business interaction. In England and Northern Ireland there is the Higher Education Reach-Out to Business and the Community (HEROBC) scheme, and UK-wide initiatives such as University Challenge and Science Enterprise Challenge, and the Higher Education Innovation Fund from 2001. In parallel, in Scotland a new Knowledge Transfer Grant has been introduced by the Scottish Higher Education Funding Council, building upon an earlier 'professionalisation of commercialisation' grant scheme. The Higher Education Funding Council for Wales also has its own programmes, such as the Higher Education Economic Development Fund.

The project involved a comprehensive survey of all HEIs (universities and HE colleges) within the UK, using a self-completion form covering both quantitative and qualitative indicators. The total population to be surveyed consisted of 168 institutions primarily funded by the UK HE funding bodies. Total response rate was 89%. Responses were analysed in three categories: the 'old' pre-1992 universities; 'new' post-1992 universities created by the 1992 Further and Higher Education Act; and higher education colleges.

Institutional strategies

HEIs were very positive about the need to support economic development, with different institutions tailoring their strategies to their particular strengths and regional needs. Whilst all institutions emphasised their contribution through access to education, research-intensive universities focused on research collaboration and technology transfer, and HE colleges were more focused on meeting regional skills needs and supporting SMEs. Sixty per cent of HEIs said that the economic development of their region was a high priority within their institutional mission, and 87% of post-1992 universities. However the definition of the region was problematic, with institutions in the South and Midlands being less inclined to identify with government-defined regions and more inclined to define their own boundaries.

A sector focus is also emerging within business interaction, largely driven by patterns of institutional expertise but also in response to demand from companies, and for at least one-third of HEIs in response to regional strategies.

Using process benchmarks for assessing strategies towards business, contribution to regional skills strategies, and incentives for staff to engage with business, most institutions considered themselves to be making some significant contributions, although few positioned themselves at the good practice end of the scale. Clearly there is scope for further development.

One element in these strategies is the development of units with specialist staff to support commercialisation. Only 8% of HEIs, mainly HE colleges, employed no staff in this role, and a total of 1,217 staff were identified across the sample. Given that the figures were for 1999/2000 (and therefore do not include recent growth in such activity) and excluded staff in departments, this shows that significant resources are being devoted to interaction across the sector.

Collaborative research

Sponsored research continues to grow, reaching about £2 billion in 1999/2000, an increase of 7.7% on the previous year. Of this, 12.3% or £242 million was from UK business, with business's contribution to total research income increasing from 10.9% in 1995/96. This proportion is slightly higher than in the US, although obviously much smaller in absolute terms.

Detailed information on the sources of industrial research income was difficult for HEIs to provide. Those that could give estimates suggested that only 19% of business research contracts were from within the same region as the HEI. Similarly, more than 60% of the HEIs reported that less than a quarter of contracts were with small and medium enterprises (SMEs). Over 80% reported that less than a quarter of research income from business was from SMEs, although only a minority of HEIs were able to provide estimates.

An important element of research collaboration with industry was in Office of Science and Technology/research council or EU programmes where business was a partner or collaborator. Again HEI information systems do not easily provide this data but this could be of a similar scale to direct industrial funding.

Other schemes such as postgraduate studentships and Teaching Company Schemes (TCS) also provide valuable support for business and are much more likely to be regionally based. For TCS, 550 out of 734 projects reported by respondents were with

regional partner firms, and this scheme was also more broadly distributed across pre- and post-1992 universities.

Intellectual property

HEIs reported significant growth in invention disclosures and patents since the previous survey in 1996/97, and strong growth also between 1998/99 and 1999/2000. Invention disclosures, although more likely to be monitored by the more research-intensive universities, increased from 1,684 in 1998/99 to 1,912 in 1999/2000, an increase of 13.5%.

Total patents filed also increased markedly over the two years, from 1,259 to 1,534, a growth of 22% in one year. These figures are also significantly higher than those reported in 1996/97 although differential response rates make direct comparison unreliable. New patents as a component of this were also markedly up, with a 12% increase in the year to give a total of 705 in 1999/2000.

The numbers of patents granted were much smaller as a consequence of various filtering processes, with only 162 granted in 1998/99 and 188 in 1999/2000.

Successful patent activity was quite concentrated among the more research-intensive universities, with 238 non-software licences granted by HEIs in 1999/2000, of which over one-third were from just five institutions. Relatively few institutions reported revenues from intellectual property that were higher than the costs.

Comparing patenting performance with US and Canadian universities, the UK sample performed well. Calculating the average value of research expenditure from external sources per patent, the UK HEIs needed less income per patent than universities in the US or Canada. US universities filed one new patent for every £2.9 million, whereas UK universities filed one new patent for every £2.4 million. However the research expenditure benchmark for patents issued was much higher in the UK than in North America.

Consulting activities

Many HEIs have been formalising their policies on consulting, seeking to regulate the amount of consulting carried out by individuals, developing schemes to encourage greater consulting within the academic contract, and formalising individual consulting through the provision of legal liability insurance. Eighty-eight per cent of all universities have a commercialisation company and/or an internal commercialisation department to manage consulting links, although over 40 % of HE colleges did not.

Many institutions are only able to provide limited data on the numbers of firms assisted, and the income associated with this, as much of the activity is not centralised. Even where it is centralised there may be considerable activity which is just not declared. Eighty-eight HEIs were able to provide estimates of the numbers of firms assisted through consulting for 1999/2000, polarised between those reporting very few links, and those reporting hundreds of companies assisted.

The total income from all HEI respondents for 1998/99 was £51.8 million, increasing to £60.2 million in 1999/2000. For various reasons this is much smaller than the real total income, partly due to the difficulties of estimating actual levels of consulting, and partly due to the low response rate for this activity.

Spin-off firms

'Spin-offs' are enterprises, in which an HEI or HEI employee(s) possesses equity stakes, which have been created by the HEI or its employees to enable the commercial exploitation of knowledge arising from academic research. Other 'start-up' companies may be formed by HEI staff or students without the direct application of HEI-owned intellectual property.

HEIs responding to the questionnaire reported a total number of 199 firms established in 1999/2000 where there was some form of HEI ownership or HEI intellectual property involved. Ninety-two per cent of these involved some form of HEI ownership. The spin-offs were concentrated in a relatively small number of HEIs: during 1999/2000 only 24 had seen more than two spin-offs with HEI ownership, and these accounted for 136 of the 183 reported. In the previous five years 338 were reported, just under 70 a year, suggesting a significant increase in the rate of formation in the last year or so. Only 45 HEIs declared equity holdings, totalling almost £194 million.

Eleven institutions reported income from the sale of shares in spin-offs during 1999/2000, for a total income of £38.4 million. Again this was mainly attributable to an even smaller group of institutions, with only three accounting together for over 80% of this total.

In comparison with universities in the US and Canada, UK universities identified a total of 199 spin-off firms in 1999/2000 – one for every £8.6 million of research expenditure. Canadian universities in 1999 created one spin-off firm for every £13.9 million, whilst in the US only 275 were identified, with a ratio of one for every £53.1 million of research expenditure. These figures seem to confound the received wisdom that UK HEIs are much less entrepreneurial than their North American counterparts. However, they should be treated with some caution as we do not know the relative success of these companies in the market.

Few institutions were able to identify graduate start-ups, as schemes to promote graduate entrepreneurship have really only begun to flourish since 1999. This indicator should show rapid growth in future. Around half of HEIs now offer incubators either on or off campus for staff or student companies, and over 70% have access to seed corn investment provided either by the HEI or by a partner.

Training and personnel links

Important areas of interaction with business remain the core activities of providing a supply of trained graduates, and providing general and bespoke training courses for businesses.

Benchmarking questions revealed a moderate use of labour market intelligence to monitor skills needs, but a more positive engagement with employers in curriculum development.

Student placements in businesses are a key means of building employability skills and linking with employers, but are typically not well tracked at a central level within institutions. HEIs found it difficult to provide accurate data on numbers of placements, although this is also due to definitional problems. The most important mechanism for arranging placements was at school or department level, with the careers services and ad hoc means also being significant.

Often a more direct relationship between the HEIs and business is in providing courses designed to meet the needs of particular groups of businesses. In general, HEIs were least likely to offer standard undergraduate degrees or degree modules tailored to meet the needs of specific businesses (less than 40%), and were much more likely to offer sub-degree or masters level qualifications developed specifically for businesses. However, non-accredited courses were most commonly offered, with almost 90% of post-1992 universities running such courses.

Regeneration

Most HEIs are now involved in some form of economic regeneration activity, albeit varied by location and access to different programmes. Overall, respondents identified £148 million of income from European Structural Funds, the Single Regeneration Budget and other schemes, although a significant minority of institutions were unable to supply figures.

The principal reasons for participating were reported to be additional funds for teaching and training, building strategic links with local industry, fulfilling the regional mission through new services to industry, and facilitating partnerships. Again there were differences in orientation among different types of HEIs and between regions.

Participation in the programmes is not without problems however, and HEIs do struggle with the burden of regulations and financial complications of these schemes, particularly the requirements to provide matching funds.

Data collection and recommendations for future surveys

In general there was support within the HE sector for the objectives of the questionnaire, in terms of measuring the nature and scale of business interaction and communicating that. It was felt that investigations of this kind were appropriate, subject to the nature of the specific questions and indicators, their timing and their use.

Within the HEIs there was a growing need for better data on enterprise links and performance data, for management concerned with the implementation and monitoring of policies on commercialisation and working with business. Several respondents responsible for business development found the questionnaire useful to support their own needs for better data. Often the questionnaire showed up existing data collection inadequacies, where HEIs have typically invested in systems that deliver only what is required by the HE funding bodies and no more.

The questionnaire exposed weaknesses in data collection and management, especially a lack of centralised data. A common problem was the need to gather information currently held only at the faculty or department level.

This prompted two main critiques: first, whether the factual indicators are the most appropriate; the second whether the qualitative indicators reflect an appropriate model of business interaction, and whether they accurately reflect the state of strategy in the individual institutions.

The biggest issue was the concern over individualised data and its publication. There were concerns that the indicators would become another league table, trivialising

some approaches at the expense of others and artificially setting the business agenda around a set of indicators that may not be appropriate as objectives.

A specific concern in designing the questionnaire was the time and effort needed to complete it. Some of the questions required detailed and disaggregated data, which would only be easily available if systems were already in place. The 102 HEIs who could provide estimates spent a total time of 2,501 hours completing the questionnaire. At a 'reasonable' average cost per day of £300 this would give a total cost of perhaps £150,000 for a full response from all HEIs.

For HEIs to provide accurate and timely information in future, they will need to invest in data collection and storage. They therefore need a clear statement of future data requirements. This should include specifications of what data needs to be collected and how, and an appropriate timetable for implementing the necessary changes.

Some data could be standardised and provided to the Higher Education Statistics Agency (HESA). This would make the collection process more mechanistic and so reduce the burden compared with ad hoc surveys.

Ultimately we recommend that the questionnaire is partly replaced by the formal collection of a limited set of hard indicators by HESA, as part of the annual financial return.

Such data will then be published for each HEI, so should not relate to any other organisation linked with the HEI (such as a spin-off company).

Qualitative indicators and questions are still useful for developing appropriate policies for the sector, and could be continued through an annual questionnaire that might change slightly from year to year.

HEIs also need to take a more strategic view of some of interactions examined in this report. Although business interaction is recognised as an important part of the mission, and is an important source of funds, it is still managed as a marginal activity. HEIs plan and manage their business primarily on the basis of core funding streams, with activities such as those examined in this survey treated as additional, volatile and managed on a self-contained basis.

For government, the implication of the survey findings is that there is a very varied approach to business interaction, with some traditional forms of business collaboration essentially limited to very few institutions. This suggests extreme caution is needed in setting narrow models of business interaction, or applying only a few indicators, or directing funds to particular categories of HEIs. The achievement of benefits for the UK as a whole, and all its constituent elements, will depend on an inclusive approach that recognises and supports this diversity.