

Review of Business – University Collaboration

Submission from BRE

April 2003

This submission to the HM Treasury sponsored Lambert Review of Business – University Collaboration is made on behalf of BRE.

1. BRE

BRE is an independent research and technology organisation (RTO) employing 600 staff, including many international experts, based at Watford and East Kilbride. Formerly the UK Government's *Building Research Establishment*, BRE was privatised in 1997 and is now owned by the Foundation for the Built Environment (FBE), a registered charity. FBE's membership is constituted from a wide base of organisations (150+) with interests in the built environment, including manufacturers, contractors, universities and end users. BRE's core competencies are in buildings, construction, energy use, fire safety and environmental aspects of buildings. Since privatisation, BRE has broadened its base of operations into new areas including manufacturing support, product testing and certification, aerospace and the financial sector.

BRE operates at the interface between industry / commerce and universities, providing research & development and other services. Much of BRE's activity is in applied science and engineering, with a firm commercial or policy application in mind, in contrast to the primary university / research council remit of "blue-skies" or fundamental research. As well as undertaking its own research, BRE harvests new ideas from the university sector.

2. Key points

Most of our comments centre upon a few key points:

- Examples of the pinnacle of best practice in business / university collaboration can be readily found. However, in the vast majority of cases practice is best described as poor or appalling. Changing this culture from within would take a generation.
- Industry tries to access universities but is put off by bad experiences. The attitudes and approach of the universities appears to be the problem, rather than that of business.
- Achieving bulk change on a reasonable timescale is possible but only through the use of intermediaries who know both business and the university sector and can readily perform the communication and integration tasks required.
- Government should support initiatives which increase the overall volume of interaction rather than provide additional rewards to the few groups who are currently working well.

3. BRE's experiences of working with universities

BRE has a long history of collaborative working with almost all the UK and many overseas universities and has on its staff a number of visiting professors. We do this primarily in the context of research, on behalf of UK Government, on behalf of sectors of industry, and for our own benefit. In addition to collaboration when working for clients, the FBE itself funds a significant number of PhDs in the built environment.

In our experience, the overall picture is mixed. There are examples of very successful collaboration, but this is balanced by a number of less successful or disastrous relationships.

One concern we have and which we hear from other business partners is the attitude universities have towards funding. They seek funding not to help industry solve its problems or to access a new opportunity, but primarily to be able to do more academic research.

Of particular frustration is turnover in PhD students. PhDs are a very cost-effective way of building up a long-term relationship between business and universities, but many projects come to an early end when the student, for one reason or another, leaves. We have usually tried to re-start programmes, requiring a delay and additional cost. We now avoid undertaking business-critical research in this way.

4. Role of intermediary organisations

Intermediary organisations (RTOs) such as BRE have emerged over the years to fill the gap between universities and industry/commerce. We perform a valuable role in integrating user need and academic resource, and in providing two-way communication and commercial project management skills. We work in applying research to the “proof of concept” stage and often beyond, working closely with industry to commercialise new ideas. A current BRE example is the development of composite materials for construction from waste. In short, we see the relationship much more like a supply chain with many players, rather than a one-to-one consultancy relationship.

Other countries operate their system of RTOs rather better than the UK does now. Significant facilities, core and project funding are directed towards RTOs such as Fraunhofer in Germany, including from their equivalent of RDAs. In the European context, this puts UK at significant disadvantage commercially.

We are convinced that rapid progress and good value for industry is obtained by universities and business working together with intermediary organisations. This is of particular value where the industry is disparate (such as construction) or remote from the science and technology (e.g., insurance).

Faraday Partnerships are a successful recent development of this relationship. The university-based participants are free to develop their ideas under academic scrutiny (peer review) while technology translators undertake the significant tasks associated with eliciting user need and communicating results. To date the DTI has supported two dozen Faradays, but these are in a limited number of sectors and there are some embarrassingly large gaps. We feel there should be many more – aiming at the 50 or so originally anticipated. We understand that there is opposition to them from Research Councils – industry’s views should be followed.

5. Best practice

There are some examples of industry/university collaboration providing real economic benefits not just to the immediate participants but to local and national industries. A good example is the Warwick Manufacturing Group, which together with BRE has helped apply manufacturing technology to house building. The key success feature of this sort of collaboration, where facilities and staff capabilities are applied on real industry problems, is in our view having a core group of specialist staff, separated from routine teaching and research group management.

Few relationships we have been involved with have involved Government-sponsored agencies like RDAs or sector skills councils in a matchmaking role. Most are developed through ad hoc contacts and discussions. In the context of RDAs, we do not see regional links as being terribly useful, as we operate in a national industry with national centres of excellence. Although proximity is helpful, we are just as likely to collaborate with Aberdeen University as with Hertfordshire, if that is where the skills are.

6. Barriers to progress

Academics tend to operate largely as isolated individuals rather than as teams. This is fine if the industrial issue is very specific in nature and one academic has the requisite skills. More usually, business issues demand a multi-disciplinary approach and team working.

In our experience, the majority of academics are uncomfortable operating outside their usual university teaching / research environment and find it particularly difficult to interface with business interests (less so with Government or voluntary sector interests). This failure could be addressed by (1) using intermediaries who understand both environments, (2) training for academics, or (3) increased team-working in university departments, using colleagues with skills in these areas.

There is much discussion in research procurement circles at present about the amount of research sitting on shelves in universities, that could be exploited in industry and commerce. This may be true in some sectors but is not in others. The responsibility for this lies jointly with the universities themselves and with their funders, primarily the research councils and HE funding councils, rather than industry. Very little effort is expended on technology transfer activities overall. Of the little funding and effort that is expended, spin-outs rather than licensing are preferred. Faraday Partnerships are beginning to address the need in some sectors. There is a distinct role for intermediaries (RTOs), RDAs and similar bodies in marketing research and capability from the university sector, but they would need funding to support such activity.

7. Graduates and postgraduates

The greatest contribution of the university sector to business is the provision of good graduates, and in the innovation/professional sectors the provision of well-trained postgraduates. BRE is a significant employer of graduates and postgraduates (450+). The numerical supply of these has increased over recent years, but the average quality has decreased somewhat. In some areas of science and engineering we are finding that graduates no longer have the requisite minimum technical skills to enable them to be immediately employable on commercial tasks – an additional training period is required. Some of this can be traced back to the school curriculum (e.g., lack of calculus in mathematics courses).

“Transferrable skills” are much in vogue at present in universities, and are often provided in the form of training courses on IT and related office skills. Although useful, we would much prefer graduates to arrive with a broader knowledge of the operations of business – finance, law, contracts, marketing, etc., than specific training that may have to be repeated on our own systems.

8. Financial and contractual

We have four main issues of concern: time, cost, quality and IPR.

Business tends to operate on much shorter timescales than universities. The typical academic timescale of multiples of one year, starting in September/October, is incompatible with most business timescales. Some universities impose minimum length contracts (typically 1 year). Project start-up periods are very long compared with commercial consultancy. Access to academics is often possible only at certain times of the year, such as summer vacations. Universities need to become more flexible to the time constraints on business and develop innovative ways of meeting these.

Financially, university work is good value compared with commercial consultancy, given that the work can be done to sufficient standards of timeliness and quality. Overheads are not currently a problem. R&D tax credits have the potential to attract more business interaction, but take-up is very low at present, because of the current restrictive definition of R&D.

Quality of university work is usually good in academic terms, but many reports have to be rewritten and simplified to be understandable by end users. This reduces the impact such reports have and invites criticism. University staff must learn to be able to address multiple audiences.

Intellectual property and its ownership / exploitation is not currently a big problem for us. Some universities are more acquisitive in terms of their claims over IP than others. In some cases this is unhealthy, as business would want to at least make some advantage from their contributions to projects.

Universities have been financially encouraged to create “spin-out” companies to exploit new IP. There is little evidence to date that this has resulted in major economic benefits to the UK. Some sectors of industry see the spin-outs as competitors. A rethink of this policy should be considered – it might be more effective economically to encourage technology licensing (like in the USA) and corporate venturing.

9. University governance, management and leadership

The structures and systems at most universities we work with appears to be well tailored to service an academic teaching and fundamental research environment. They do not appear to be well suited to applied research (where cross-departmental multi-disciplinary working is necessary) or for technology transfer activities.

Departments (and to some extent faculties) appear to operate independently of central “control”, though often under guidelines and with the provision of central services such as finance. There is usually an element of tension between the individual academic, their department, and the university. Some academics prefer collaboration between institutions rather than within their own.

Despite their recent wailings about funding shortages, universities and their staff are relatively well-protected from economic realities. There is no current impetus for radical change. It has been suggested that more competition would help improve matters, such as opening up research council funding channels to industry bidding.