The IEE
Savoy Place
London
WC2R 0BL
United Kingdom
T +44 (0)20 7240 1871
F +44 (0)20 7240 7735
www.iee.org

Engineering the future

16 April 2003

Ref: S644/2003

The Lambert Review of Business-University
Collaboration
1 Horse Guards Road
London
SW1A 2HQ

Dear Mr Lambert

THE LAMBERT REVIEW OF BUSINESS-UNIVERSITY COLLABORATION

IEE has a world-wide membership of over 130,000 professional engineers. These members represent a wide range of engineering disciplines including electronics, communications, computing, software engineering, power engineering and manufacturing.

In this submission we have focussed on the experiences of our members in the IT and electronics sectors. In these disciplines there is enthusiastic, close and effective collaboration across a very wide spectrum of applications and business models, with considerable mutual respect between business and academic communities. Public investment in scientific research in IT has been shown to create considerable wealth, year on year, and the UK's performance in generating spin-off companies is exemplary.

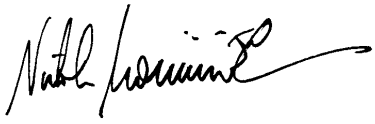
This submission combines the experience of members from both industry and academia. The academic input on this occasion includes comments from the UK Computing Research Committee (UKCRC), an expert Panel of the IEE and BCS which aims to promote quality in computing research. The membership of UKCRC has a wide range of experience with working with industry on undergraduate and research training as well as collaborative and funded research projects.

While the IEE is very pleased to be able to offer the collective advice and views of its members to Government, our members are busy people, many of them in top positions in industry and academia, and we would ask Government to limit the burdens of consultation by applying “joined up Government” wherever possible. We are concerned in this instance that the scope of the Review appears to overlap enquiries recently undertaken by other Government Departments and agencies, for example the Higher Education-Business Interaction Survey 2002, published by HEFCE in March 2003. The Report by the House of Lords Science and Technology Select Committee entitled “Chips for Everything” also contains material of direct relevance and is recommended to the Review Team.

The appendix to this letter contains more detailed answers to selected questions, together with links to other relevant IEE submissions.

If the IEE can be of any further assistance, please let me know.

Yours sincerely



Dr Nicholas Moiseiwitsch
Head of Engineering Policy
T +44(0)20 7344 5438
E nmoiseiwitsch@iee.org.uk

1) Best practice and examples of excellence in business university collaboration in the UK and abroad.

In Computer Science, researchers greatly value their widespread involvement with industry. These interactions improve the quality of scientific research through exposure to good science that is being undertaken in industry, access to resources and awareness of industrial problems. Researchers derive great benefit from tackling important practical problems and seeing their ideas implemented on industrial scale.

There are good examples of industry and academia working together. Our experience is that many such successful initiatives are the result of personal contacts. In this regard, academic / industrial "networks" are very successful in that they enable academics and industrialists to come together and make these personal contacts. Likewise, spin outs from universities often continue to have excellent relations. The importance of these mechanisms in the field of Integrated Electronics was recently highlighted in the House of Lords Select Committee report on Science and Technology "Chips with Everything" - their value extends to all technology areas.

A strong national research base provides a window into the international research community, and hence the international market. Whereas multinationals can pick to work with research groups anywhere in the world, a key way in which UK-based industry can access the experience and direction of the international community is through UK universities. Maintenance of the international strength in UK research is critical for this role to be fulfilled.

2) What are the main barriers to strengthening business-university relationships?

One significant difficulty in building good collaborations, which is alleviated sometimes by personal links, is the issue of Intellectual Property. In general both sides approach the negotiation with established, though mutually incompatible, positions. The error, on both sides, is that there is no "one size fits all" contract and IP position; it varies according to the topic of research and even the nature of the industrial collaborator. Consider three different views of a research project that generates software: a software company views it as a revenue source, a hardware vendor may view it as driving demand, a services company as something to be supported. In the first case, proprietary advantage is sought; in the second and third putting the results in the public domain through an "open source" licence is acceptable and perhaps even in the public interest.

The importance of understanding these issues and the consequent impact on contract "price" was highlighted in the July 2002 OST report on "Investing in Innovation". Developing best practice and deploying it across universities would greatly enhance collaboration.

A second issue is UK industry's apparent lack of interest in PhDs, as opposed to MScs and graduates, compared, for instance, to the USA. (Multinationals based in the UK such as Microsoft, HP, and IBM are exceptions to this lack of interest.) There is concern that it reflects a focus on development and short-term research, as opposed to strategic research. This narrow focus inhibits interaction with academia. In fact, many UK academics have more productive interaction with US industry than with UK industry, as a result.

3) How can business attract the best graduates and postgraduates with the skills that they require, especially in technology?

One of the ways in which industry communicates its needs for specific scientific or technical skills and for the development of relevant courses in universities is through the Degree Accreditation system. This is arranged through the relevant professional bodies and gives an assurance to prospective students that a course that is accredited meets high standards. Students studying on such courses have the benefit of knowing that their course automatically qualifies them for the educational element of becoming a Chartered Engineer.

Industrial input to the programmes, through mechanisms such as Industrial Advisory Boards, is one of the assessment criteria used by Accreditation Visit Panels. Panels, themselves, also contain at least one industrialist. Both types of industrial contact influence degree programmes to make them more relevant to industry's requirements. Panels also assess Key Skills, such as Communication and Group Working skills, as part of the standards laid down by the Engineering Council (UK) in SARTOR 3.

A specific example of Business-University collaboration is the Problem Based Learning Project, which is managed by the IEE. This is a HEFCE-supported collaborative project in partnership with UCL, UMIST and the University of Bristol. The aim is to introduce Problem Based Learning (PBL) into re-structured MEng and BEng Electrical and Electronic Engineering degree programmes at the three universities. The initiative arose in response to concerns and criticisms from employers that the engineering graduates currently being produced were lacking in essential skills. For example the research has shown that 77% identified that they require graduates who know how to learn and 74% identified problem-solving skills as a requirement.

PBL is a modern technique where students work in small groups to learn by solving problems which have been designed to cover curriculum normally taught by traditional lectures. Financial support is being sought from Industry and the project outcomes include an evaluation of the effectiveness of PBL compared to traditional programmes, and the Key Skills gained by students through this method. The IEE will be pleased to supply more information on the progress of this project on request.

4) Do financial considerations currently help or hinder the relationships between business and universities.

In areas such as microelectronics, the rapid technological cycle in the business (typically 12-15 months) and the current funding mechanisms (often based around 3-year projects requiring a six-month approval process) are ill matched.

The recent consultations which we believe have a bearing on this subject include:

- House of Lords Select Committee Enquiry "the Future of Microprocessing", report entitled "Chips for Everything", November 2002. The IEE's evidence can be found at http://www.iee.org/Policy/Submis/abstract/pabs613.cfm (see paragraphs 30 to 41)
- House of Commons Science and Technology enquiry "Science and Europe", report expected shortly. The IEE's evidence can be found at http://www.iee.org/Policy/Submis/Abstract/pabs638.cfm

- Higher Education-Business Interaction Survey 2000-1, HEFCE, March 2003
- The Cross-Cutting Review of Science and Research, (HM Treasury, DfES, OST and DTI), March 2002 but only recently available publicly
- OST report "Investing in Innovation", July 2002.

HMF
15 April 2003