

## **UNIVERSITY RESPONSE TO LAMBERT REVIEW**

### **1. BEST PRACTICE**

#### **1.1 Infrastructure**

The University's fundamental mission is the advancement and dissemination of knowledge and understanding. It follows that the definition of “best practice” is that which promotes and maximises the fulfilment of the University’s mission.

In the last few years, the University has taken two major steps that directly support its mission. In 1997 it set up Edinburgh Research and Innovation (ERI). ERI has a team of business development executives who work alongside academics in support of commercialisation of the research base, through efficient knowledge transfer and innovation support processes.

The University has put in place a successful commercialisation strategy, the key aims of which are:

- to increase the volume of research activity, by broadening the sources of sponsorship, whilst retaining the University’s international reputation for excellence
- to evaluate effectively and exploit new ideas
- to establish an integrated company development programme
- to maximise the local economic impact of the University’s activities

As part of its company development strategy, which has seen the formation of 48 companies in the past 5 years, the University has appointed a Company Formation Manager who spends his time helping early stage University companies prepare business plans and secure seed or first round funding.

More recently, the University restructured of its academic units and is now based on 3 Colleges containing a total of 21 Schools. The Colleges are (i) Medicine and Veterinary Medicine, (ii) Science and Engineering and (iii) Humanities and Social Sciences.

#### **1.2 Interactions with business**

The University has a wide range of interactions with business, including collaborations, informal contacts and formal contracts.

**1.2.1 Use of industry patents.** There is anecdotal evidence to suggest that academics do not generally review patent databases to further their research and that they make extensive use of patented technology in the belief that they are exempt from infringement.

**1.2.2 Joint ventures.** The university has noticed increase collaborations other than the conventional set-up of industry funding a research project. IP problems sometimes

occur with these more “creative” collaborations if industry believes it has purchased foreground and background IP, despite having met only the basic cost of the research.

**1.2.3 Informal contacts.** These include meetings and conferences (where best practice involves a degree of formalisation of such networks so as to permit knowledge and information to reach a wider audience than would normally be the case); industry-sponsored university posts or studentships (for example, in the College of Humanities and Social Sciences, the largest area of student sponsorship is in the part-time MBA course, where approximately 65% of students are sponsored by employers); work experience for students; business contributions to curriculum development and provision of Continuing Professional Development (CPD) training.

The University of Edinburgh has established several cross-disciplinary centres which have actively engaged with industry from the outset. Current Centres include Collaborative Optical Spectroscopy Micromanipulation and Imaging Centre (COSMIC), Scottish Instrumentation and Resource Centre for Advanced Mass Spectrometry (SIRCAMS) and Edinburgh Materials and Micro-Analysis Centre (EMMAC). One mode of interaction which all of these Centres has adopted is to take delivery of leading edge instrumentation or other equipment and in return for a discounted rate (in some cases 100%), the researchers extend and improve the functionality, allowing the company to feed this back into the next generation of product. So, in carrying out basic research, new instrumentation is developed with capability beyond that which could be achieved by the company’s own R&D activity. Similarly, by the nature of the basic research conducted, new applications knowledge is acquired which can enhance the supplying company’s ability to market the equipment more widely. Specific examples here include extending the functionality of microscopy equipment and visualisation software within COSMIC, improving the biological sample handling ability of mass spectrometers in SIRCAMS, and extending secondary Ion probe applications areas within EMMAC.

Collaborative research is most often carried out within specific formal funding mechanisms such as LINK schemes, European Framework Programmes and TCS projects. However, in some cases, it is felt that TCS provides insufficient overheads to cover University costs and often results in IP flowing to industry without adequate remuneration to inventors. There is a perceived lack of willingness by industry to meet the full cost of both research and IP.

Interaction can be initiated in either direction, but some industry sectors, especially larger companies, are certainly highly proactive in identifying academic research groups of interest through scientific conferences, meetings of learned societies etc. SMEs often rely on the local enterprise and other support agencies as an intermediary in identifying appropriate research groups.

The University has run several “Industry Days” where colleagues from industry are invited to meet leading University researchers and hear about latest advances in University research. The objectives of these days are to increase the dissemination of knowledge and to increase collaboration. Recent events here have included the application of chemistry in electronic and optoelectronic applications, Nanotechnology and biological chemistry. These events have been useful in forging

new links and in at least one case, a licence for a potential oncology related therapeutic.

**1.2.4 Formal contracts.** There are two main areas here – (i) research and consultancy with the professions and the public and private sectors and (ii) the formation of spin-out companies. The University has had many successes in these areas, amongst which –

- The Mobile VCE (Virtual Centre of Excellence) is a strategic research collaboration involving 8 Universities and 22 industrial participants, and is a fine example of Universities and Industry working together to achieve effective research and knowledge transfer. As part of the on-going collaboration, the University participants are now also looking at the industry portfolio of patents with a view to increasing their volume of commercialisation activities.
- The collaboration between the University of Edinburgh and Cyclacel Ltd. is an excellent example of collaborative research and development. Under the agreement announced in March 2002, the University of Edinburgh and Cyclacel will be jointly applying state-of-the-art rational drug design techniques, including computational biology, X-ray crystallography, NMR structure, computational and combinatorial chemistry techniques, to the discovery of novel molecules. As part of the collaboration, two University of Edinburgh Professors, from two different University Schools, have been seconded to Cyclacel for three years, although this flexible agreement is designed to enable both of them to carry out further academic research within their respective Schools. Another part of the agreement is the exclusive licensing to Cyclacel of the University of Edinburgh's LIDAEUS™ *in silico* screening software programme.
- The University is part of the Scottish Institute for Enterprise (SIE) which has two fundamentals roles:
  - To improve the quality and quantity of entrepreneurial education in Scottish Universities; and
  - To provide assistance to support the commercialisation of student ideas.

Among the initiatives that have been supported by the Fund (to fund initial patent filings for student companies), the Innovation developed by SIE are the Student Patent Fund (to fund new and innovative initiatives to increase/improve commercialisation activities) a Student Business plan competition, and numerous high-quality educational events.

**1.2.5 RDAs** are potentially beneficial but we have found that they tend to ask for details of academics with particular expertise at too short notice and with too few details. Perhaps their relationship with Universities could be improved by developing an ongoing understanding of expertise instead of responding to industry visits. Academics are interested in industrial collaboration if this benefits their research but are not keen to respond again and again to queries without any positive outcomes.

## 2. MAIN BARRIERS

From the demand side, the University's perception of barriers which deter businesses - in particular Small and Medium Enterprises (SMEs) - would include:

- Problems in accessing an academic knowledge base that may assist in achieving a highly focused research or commercialisation project definition.
- The access of information on specific knowledge, research and resource capabilities at school, team and individual level is perceived to be difficult in spite of publications in scientific literature, creation of databases such as SRIS etc.
- There is no easily accessible source defining industrial, particularly SME, technology and research needs, equivalent to SRIS. The perceived onus is therefore on the universities to identify needs. This is inefficient.
- The engagement process may be lengthy and over bureaucratic, particularly if third parties external to the partner University are involved (e.g. the RDAs).
- A perception that Universities are slow to re-act. For example, CPD and consultancy requires not only being affordable and relevant, but also timely.
- A reluctance to pay the full cost of University work. There needs to be better mutual awareness of the needs of Universities, Government and Industry. Universities are not entirely funded from Government and are required to, and want to, increase their income from non-Government sources. Industry needs to recognise that they cannot always seek to pay Universities minimum amounts for overheads on research deals, and minimum royalties on licence agreements. Government needs to recognise that they sometimes place contradictory demands on Universities in relation to commercialisation. Funding agencies require Universities to commercialise effectively, yet when Universities try to do so, their efforts are often not supported or worse, ignored. Universities need to recognise that industry is not always a cash-cow and that their technologies may be early stage in the commercialisation process, and thus they may not be entitled to large royalties/equity stakes.
- There is not always a clear understanding of the relative roles of the University and Industrial partners at an early stage particularly with regard to IP. This, as may be expected, is especially true of companies who have not previously interacted with the University sector. Also, there is a diversity of practice internationally, so that the expectation of say UK, USA, Japanese, Dutch and Norwegian companies in dealing with a UK University may be quite different.
- There is insufficient recognition particularly within the UK sector, of Universities as IP generating, owning and exploiting entities. This is a dynamic and changing situation, and the better and more efficient Universities become at exploiting IP, the more lack of acceptance that they should act in this role becomes an issue for some more traditional businesses, accustomed to acquiring technology for little or no cost.

- Funding mechanisms are good and appropriate drivers of collaboration, but there is a growing diversity of such schemes. The introduction of new initiatives must clearly add value over what can already be achieved by existing mechanisms. There is a danger of a high reliance on more schemes rather than a few well-funded mechanisms consistently available over a long time period.

On the supply side, we would acknowledge that, even with a clear understanding of the requirements in terms of deliverables, time, and costs associated with a business service or project, universities still have to overcome internal barriers such as:

- Poor lines of communication across disciplines.
- Having a good understanding of the human, physical and intellectual capital resource base, both within individual universities and across collaborating institutions.
- Conflicting messages and pressures on individuals to juggle teaching, research, administration/management and commercialisation commitments.
- Uncertainty associated with funding streams, particularly relating to the longer term. Lack of 'quick reaction' mechanisms
- Commercialisation is not recognised as a route to academic promotion nor to academic advancement/recognition. University promotions are still dependent largely on publications (not always commercialisation's best friend) and there has been little recognition of commercialisation in the RAE.
- Reluctance of some individual academics to 'share' information and contacts. Informal contacts often rely on goodwill, rather than on the expectation of a financial payback and these relationships need to be handled appropriately.
- It is not a requirement that academic staff disclose IP to ERI before publication. Failure to do so has led to the loss of some commercialisation opportunities in the past and is likely to continue to do so.
- Awareness of IP is patchy and needs to be improved. There is a fear in industry that IP leaks out of Universities and that is often levelled as a reason for not collaborating. This is generally an out of date perception, but there remains work to be done. This University runs IP awareness events for both students and staff. One way of improving matters may be for all postgraduate students to assign their IP to the University in return for being treated like an employee in the event of any commercialisation. This would both help the perception of industry regarding the University's ability to look after IP, and the ability to negotiate deals in a more timely manner.

### **3. PROVISION OF HIGH QUALITY GRADUATES**

Industry values highly our graduate output. In particular within the school of Engineering and Electronics we have been awarded a total of 47 annual scholarship places from 12 companies to provide up to £25k to successful undergraduate students to directly support their studies in Edinburgh. The total through course value of these scholarships for students entering the University in years 2001, 2002, 2003 is almost £2.5M. The Schools of Informatics and Chemistry have a further 20 similar annual scholarship awards.

Edinburgh is also recognised as a premier research institution. In addition to direct industrial contracts for supporting specific research projects, we have signed strategic or similar alliances at University level with for example Sun, IBM and BAE SYSTEMS. These have resulted from the successful employment of our recent PhD graduates and the recognition of the contribution they have made to growing the business of these and other companies.

### **4. FINANCING ARRANGEMENTS**

- Industrial funding can appear less attractive to researchers than, say Research Council or Charity funding, as a result of the time taken to negotiate deals and the (perceived) difficulties relating to IP ownership/control.
- All Government Departments should pay the overhead rates calculated by the Transparency Review for Universities. Currently different Departments will pay different rates and this leads to confusion and adverse financial effects on the Universities. Changing this practice would send the correct message to industry, some of whom think that they should only pay minimum amounts.
- Possibly incentive schemes to be built into government-sponsored research contracts (e.g. payment to academics for patents filed, payments specifically to support commercialisation work).
- Part of RAE funding a University receives could be linked to recognition of commercialisation efforts.
- Government could specifically fund commercialisation executives to work in University Technology Transfer Offices and their on-going training requirements.
- It is too early to say the extent to which tax credits will affect University business interaction. It will inevitably be positive but will need more promotion.
- Introduction of tax credits on royalties for inventions made in the UK would increase the level of R&D activity within companies and in particular attract the R&D divisions of companies in the UK. This would benefit University/Industry interaction as it is easier to contract with local firms. It would also improve the retention and expansion rates of companies locating in the UK.