

LAMBERT REVIEW

Response from University of Paisley to Consultation Questions Relevant to Academia

1. BEST PRACTICE AND EXCELLENCE

Management and Organisation

At the University of Paisley a formal, managed structure and resource exists for the purpose of strategic and implementational administration of knowledge creation and transfer (research and commercialisation). The key administrative department is the Innovation and Research Office (IRO), whose Director reports to an Assistant Principal. Knowledge transfer strategy is advised by a University Commercialisation Board that includes external industrial members as well as senior administrative and academic management. Procedures are embedded within the administration and the academic Schools to facilitate, monitor and control the knowledge creation and transfer process.

Academic Structure

From August 2003, each of the University's seven Schools will appoint an Associate Dean of Research and Commercialisation who will coordinate research and commercial activities at School level through a School Research and Commercialisation Board. In addition, a Commercial Unit within each School will coordinate and administer commercial services to industry arising within or regularly available from that School. It will, in liaison with Innovation and Research Office, ensure service timeliness and quality and will actively seek to extend and enhance the University's engagement with companies small and large, local, national and international.

Interaction with Industry

Paisley has a well developed reputation for informal and formal interaction with industry, particularly Scottish industry and particularly SMEs. We are not aware how much use is made by industry of academic publications, but we assume that, as one would expect, some companies do keep track of publications in fields of interest to them and that this occasionally advises them of academic activities they may wish to follow up. Our experience, however, is that contacts arise in many ways: via academic participation/networking at conferences, through active contact made by the University for student placement and marketing purposes, by recommendation from local enterprise agencies, through general networking, via invitation to companies to visit the University for events/seminars, as a result of CPD activities, etc. The University also works closely with Hillington Park Innovation Centre - an innovative technology support facility funded through a public/private partnership - which aims to nurture and incubate new technology companies in the area. There are links with staff and students and the Vice Principal of the University is a member of the Managing Board for the Centre. It is this very diversity of activities, both pro-active and reactive, that ensure we maximise our exposure to interaction with industry.

Staff Secondment/Student Placement/Knowledge Transfer

It is not normally possible except under special fellowship funding, for academic staff to be seconded to industry for any significant length of time. Universities cannot easily replace key teaching and research staff, and we tend to prefer to utilise schemes such as the CS (formerly known as the Teaching Company Scheme) to encourage the guided transfer of knowledge and know-how from the University into industry in a practical way. We would welcome additional Government support in the TCS – offering perhaps even better incentives to companies to take part and providing a networking capability to matchmake company needs to universities with the specialist expertise suitable to address those needs through TCS. We would also welcome any initiative that assisted industry in its ability to accept student placements: we have found that this can lead not only to job creation for graduates but also to other beneficial interaction through the development of long term relationships with companies who take students year after year.

In-spinning Technology

We do not generally find that we make use of industry patents/prototypes other than as contracted development agents/collaborators. There are exceptions, and we retain an open mind to unusual approaches made to us. One such, from a local inventor of a totally novel, privately patented engineering-based technology for flood control, has led to a developmental collaboration which now involves five companies as well as the University, and prototype products are being manufactured within the University. Examples of recent/current interactions, including this one, are appended.

Formal Commercial Interaction

Paisley encourages informal industrial interaction but is conscious that we are required to conduct third stream activities with both outreach and output purposes. Once interaction reaches the point where substantive University staff time, facilities or intellectual property are involved, we negotiate formal contracts accordingly. Contracts may be worth a few pounds or hundreds of thousands of pounds. They may be collaborative, consultative, developmental, provide technical or problem solving services, or involve contract research. In addition, through well developed audit and reporting policies and mechanisms relating to new inventions, Paisley identifies, evaluates, protects and exploits its own intellectual property.

Intellectual Property and Commercialisation Support

Paisley has a Commercialisation Policy which applies to all staff and to postgraduate students, who automatically assign IP created during their work to the University. The policy sets out in detail all aspects of the expectation of the University of its staff, and the obligations of the University to its inventors and to those who engage in commercial interaction. Appropriate staff incentives and rewards are in place and are reviewed. There remains some concern as to whether all staff bother to access the policy information, which is freely available in various formats. This is a matter of internal communication and corporate and employee responsibility and we continue to address it with initiatives.

The University has a responsibility to try to identify and commercialise all its IP and takes this responsibility seriously. Various mechanisms and initiatives operate to encourage disclosure of new IP, from which point the IRO coordinates the commercialisation process. For each patentable invention, a commercialisation team is formed and external support networks are harnessed as needed to bring the opportunity to market in the most appropriate way, whether by licensing or spinout. Indeed, we work very closely in many aspects of knowledge transfer and commercial interaction with our local enterprise companies, Scottish Enterprise, Connect and many other network and support groups. We also make use, wherever possible, of funding (eg: ERDF, Proof of Concept Fund Award, SMART Award, etc) available to support the plethora of commercial and commercialisation activities in which we engage. Proof of Concept funding is vital to fill the pre-commercial gap between fundamental research/discovery and prototype/product development and we recommend that this essential scheme be broadened and further funded in the long term.

2. BARRIERS

There will always remain some barriers which from time to time may prevent any University from interacting with industry as much as perhaps might be wished:

- a) The key prime functions of any university are teaching and research. Commercial interaction is a third but smaller part of the remit and Government cannot expect it to become the main priority for universities at the expense of either teaching or research. Staff time and cash resource are limiting factors. Many university staff, both academic and administrative are already contributing beyond the limit of expectation, working very long hours and demonstrating extraordinary commitment. However, resources become ever tighter and if the Government wishes to see significant growth in university/industry interaction it would need to invest in resource capability within universities to ease the academic and administrative workload and permit more time to be spent on nurturing commercial contacts.
- b) It would be helpful to have more funding available to support better networking to matchmake industry needs to university capability, to fund the use of university assistance by SMEs in order to stimulate them into interacting more with us, and to cover the costs of increased administration associated with an increased level of formal commercial engagement.
- c) Smaller universities can find it difficult to fund patent protection and maintenance whilst early stage technologies are nurtured towards licensing and spin out. We would recommend the setup of an IP fund to which universities could bid – under a rapid procedure, since IP often needs to be protected rapidly once recognised – with decisions on funding the IP based on a submitted disclosure incorporating an overview of commercial applications and estimated market size. Alternatively, additional small university-weighted funding under a scheme such as the SHEFC Knowledge Transfer Grant would assist.

- d) Sometimes industry expectation can act as a barrier. Universities cannot supply warranties with IP licenses, nor can they afford to engage in IP infringement litigation. Universities have very limited funds to spend on legal assistance in general, and large companies can bring much pressure to bear because of their stronger financial position, making it sometimes hard to find a win-win deal. Industry needs to better understand the constraints acting on universities and be encouraged not to take advantage, or expect to be able to pick up intellectual property for less than its true market value.
- e) Because universities are collegiate and there is a culture of autonomy and academic freedom, companies can become confused about whom they should deal with – they may have initial contact with an academic, who may not inform the University Innovation and Research Office until the client has already developed an expectation that their relationship is with the academic, when in fact it is with the University. This can lead to problems as academics may either give IP away without realising, or undersell their skills and services. There is no easy answer, since barring companies from talking directly to academic staff would be counter-productive in the extreme. Clearly, one solution is a better education of academic staff as to proper procedure within universities: this is again limited by staff time and resource.
- f) Commercialisation can hit all sorts of barriers: non-commercially-orientated academic inventors (non-cooperation by an inventor is likely to be the death knell of a patent); lack of funding to evaluate an invention properly (the more complex the invention, and the more commercial applications it has, the costlier it is to conduct market research to establish the optimum routes to market, etc); lack of proof of concept funding (preventing the invention from progressing to the stage where it can attract venture capital or commercial licensing); lack of marketing funding (reducing the ability of the University to advertise its IP to industry or find targeted licensees); lack of legal/administrative funding (preventing the University being able to negotiate good licence deals or spin outs). Some of these barriers are being addressed but there is still the need for further funding into universities to support commercialisation activities, particularly in new universities which do not have a long history of patent revenues that can be recycled into new projects and which struggle to fund adequate administrative resource in commercialisation and marketing. University funds spent internally on this are of necessity being diverted from other core academic areas which suffer as a result. The annual costs of our commercialisation activities and our other knowledge transfer activities far exceeds the amount we receive in our Knowledge Transfer Grant.
- g) Universities have problems attracting well-qualified school leavers into technological courses. Perhaps professional bodies could find additional ways to promote the value of these types of courses and the industrial careers that can follow.

3. GRADUATE/POSTGRADUATE EMPLOYABILITY

The University aims to provide vocational courses and to produce graduates with a high level of employability. It makes itself aware of the needs of local employers by including local industrialists on School Industrial Advisory Committees, by offering degrees with placement options and by encouraging staff to network with local industry. Wherever possible this input is incorporated into course content and design - although in some cases very different needs are expressed by multi-national companies compared to SMEs.

We run an annual poster competition for postgraduate research students with invited representatives, judges and sponsorship from local companies, run open days for local companies and offer a variety of services and training events tailored to business needs.

We are well aware that we need to have customers for our courses at both ends of the process. We need to market degree programmes that attract applicants as well as providing graduates with appropriate skills. In many instances there is a mismatch - the demand for skilled chemical engineers for example exceeds the interest in the discipline shown by school leavers and other applicants. This mismatch is difficult for universities to solve - and is further complicated by the time lag of 5-6 years between the stage of an application to a course and the supply of a graduate ready for work. It would be helpful if employers could work with organisations such as the Institutes of Engineers to promote their subjects in a generic way thus raising the status, for example, of engineering in the eyes of university applicants.

4. FINANCIAL CONSIDERATIONS

Comments are as follows:

- a) It is our experience that SMEs find it difficult to afford university expertise. Perhaps new government incentives could be designed expressly to help industry, and in particular SMEs, to take advantage of academic know-how.
- b) The TCS Scheme is well recognised as a good route to innovative interaction between academia and industry. Perhaps thought could be given to reducing the cost of participation for smaller companies to encourage greater take-up.
- c) Very few chairs and studentships are sponsored by industry. There can be great and long term mutual benefits from such sponsorship, since there is generally additional associated interaction as a result. Research interests can be enriched and guided by sponsor input and need, and informal and formal technology transfer is thus more likely to result. Studentship projects are generally designed to meet R&D interests of their industrial sponsors – an inexpensive way of outsourcing R&D. One possible way to encourage this might be government match-funding for such chairs and studentships.

- d) We have not observed any increase in outsourcing demand as a result of R&D Tax Credits. Clearly this scheme particularly assists small R&D-intensive companies and may be significantly beneficial to academic spin outs which often have early stage technologies requiring further R&D before products can be brought to market. It is possible that the scheme encourages such spin out companies to outsource R&D to the universities from which they sprang, but we have no evidence of this. Often a company with a need cannot easily find the right academic expert/university to fulfil that need. Ways of influencing business demand for academic research and skills might include the funding of universities to permit a number of activities hard to fund at present, for example: more proactive dissemination of details of their research capabilities/facilities to more targeted industrial audiences; organisation of partnering meetings; visits by academic staff to companies to present talks on their academic research; the use by universities of non-free advertising sources to promote intellectual property available for license; the ability to fund formal market research towards interaction matchmaking; the acquisition of commercial databases and business addresses to facilitate partner-seeking and other similar marketing activities. Help might also be given to companies to locate partners for research. The funding of regular local partnering meetings between academia and industry in different areas of the UK could be very useful, as face to face contact is the most effective mechanism for closing contract research deals.

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10th April 2003

Examples of Successful Industrial Interaction

Thin Film Centre – a University centre of excellence in optical thin films.

The Thin Film Centre, set-up with funding from a SHEFC RDG Grant, has just signed a LINK-supported development contract with Dupont-Teijin Films for polymer-based flat panel displays. The contract will be to develop flexible displays based on OLED (organic light emitting diodes) printed into the polymer sheet produced by Dupont-Teijin. For a flexible display to be viable, they need to have a working life of at least 10,000 hours. Water vapour, to which polymers are much more susceptible than glass, limit the working life for displays based on this technology.

The very high performance barrier coatings to be developed by the Thin Film Centre will prevent oxygen and water vapour from reaching the OLED, thus allowing Dupont-Teijin to produce high quality polymer-based flat panel displays. A huge world market is available to the first company to mass produce these displays.

Meiklewall – a flood control company working with the University.

Britain's flood defences are seeing some of the greatest investment they have seen for years. The University, working with local company Meiklewall and Scottish Water, is developing innovative flood defence mechanisms such as the floating wall and sewage surcharge prevention measures. The floating wall is a flood barrier located below ground until activated by the action of flooding, the floating wall then literally floats / rises, to create a barrier between the flood waters and the area to be protected. The fact that when not in action, the floating wall is below ground and therefore not visible, makes it most suitable for areas where structures such as walls or large earth mounds would be unacceptable.

On completion of the development and testing later this year, a new range of flood prevention measures will be marketed by Scottish Water throughout the UK, and ultimately Europe and the USA. This very exciting collaboration will be very high profile in the near future.

Microscale Sensors

Following the successful launch in late 2002 of the Microscale Sensors Fabrication Laboratory, supported by SHEFC's Science Research Investment Fund, the Microscale Sensors Group has formed a series of strategic alliances with small to medium sized enterprises across Europe and is drawing down funding for collaborative research and development using EPSRC Case Student, TCS and CIFRE schemes. The Group has also submitted a Proof of Concept application to develop a revolutionary ultrasonic sensor for sonar, non-destructive testing and medical applications.