

Knowledge Transfer Partnerships Conference

Glasgow

Monday 12 June 2006

While few would question that Universities and other higher and further education establishments have a crucial role to play in the economic and, in my view equally important, the cultural development of the nation, there is, I feel, still much debate surrounding precisely what that role should be and how it can be best played.

What I should like to do over the next half hour is to share with you some thoughts, both as to the nature of the role as I see it, and also how it can be best, or at least more effectively, be played. However, before doing this I should make it clear that, while these thoughts and ideas are undoubtedly influenced by the time I spent with the Scottish Higher Educational Funding Council, they are very much my own personal views and should not, in any way, be taken to necessarily reflect the views of either my former colleagues on the Funding Council or, for that matter, the policy of the Council itself.

With that disclaimer out of the way, let me begin by saying that I believe we are extremely fortunate in Scotland in having an absolutely outstanding higher education sector and one which, not only punches above its weight on the world scene, but also one which I see as being a real competitive edge for Scotland as we progress into the twenty first century.

Before stepping down as Chair of SHEFC in October last year, when the Higher and Further Education funding councils were merged to form a new single council responsible for both sectors, I had been involved with the Council essentially since its formation in 1992, first as Chairman of the Quality Assessment Committee and latterly, since 1998, as Chairman of the Council. Over this period, there is no doubt in my mind that our higher education establishments have, not only undergone significant change but have also made significant progress.

The results of the last Research Assessment Exercise, which is carried out every five years and which is designed to grade UK academic research against international benchmarks, showed that 50% of all academic researchers in Scotland who took part in the assessment work in departments which are judged, by independent assessors, to be internationally excellent. That compares to a figure of just over 20% at the time of the previous assessment.

Figures published a couple of years ago showed that 50% of all young people in Scotland undertake some form of higher education by the time they are 21, compared to just over 40% in the rest of the UK.

For first degrees, our graduation rates are above those of all the OECD countries for which data is available.

Higher Education Institutes are on the whole incredibly complex organisations and, in my view, often more difficult to manage than equivalent sized organisation in the private sector. They have a variety of different stakeholders – academics, students, an increasing range of funders, not to mention politicians and the local communities in which they operate. They have very limited freedom to set their prices, or to manage their costs, and they have to be ready to adapt their plans to meet ever-changing public policies. Overall, from what I have seen first hand in Scotland, the management of our HEI's is of a very high calibre as indeed is their governance.

Finally, in terms of intellectual capital, recent statistics have demonstrated that Scottish universities are just as efficient as their US counterparts, and significantly ahead of their European rivals, in creating intellectual capital that is capable of being exploited commercially.

Having said all that, there is also little doubt, that, in terms of private sector economic activity, job creation outwith the public sector and new company growth, Scotland is well down the international leagues tables.

Recently, John Ward, who is Chairman of Scottish Enterprise, somewhat controversially compared Scotland to a former Eastern Block country in that over 50% of GDP now comes from the public sector, which, in terms of employment, is the fastest growing sector of the economy with getting on for a third of the working population being employed by the State. It is a salutary fact that when the Scottish Parliament came into being, the annual budget of the Executive stood at just over £16 billion. By the end of 2004-5 this figure had increased to £25.5 billion. And, by the end of 2007, it is estimated that it will have reached more than £30billion.

Increasingly the focus seems to be on wealth distribution rather than wealth creation. I venture to suggest that there is an urgent and pressing need to change this balance and, although our higher education establishments undoubtedly have a part to play in re-energizing the Scottish economy, I think we need to be very careful not to focus solely on their role while ignoring the wider picture.

Extrapolating from the conclusions of the recent Lambert Review of Business-University Collaboration throughout the UK. It would seem to me that the main challenge for Scotland is not about how to increase the supply of commercial ideas from universities into business. Instead, the fundamental question centres on how to raise the overall level of demand by business for research from all sources. Measured against other developed countries, the research intensity of Scottish business is abysmally low. In terms of corporate R and D spend Scotland is pretty near the bottom of the OECD table and well behind the rest of the UK. For example, figures published in August 2002 showed that Scottish businesses on average spend only £250 per employee on R&D, compared to a UK average of £600 and, measured against other developed countries, the research intensity of British business on the whole is itself relatively low.

For example, in 1991 the UK's total spending on R&D as a proportion of its gross domestic product was higher than that of any other member of the G8, with the exception of Germany. By the end of the century, it was lagging behind Germany, the US, France and Japan, and only just keeping pace with Canada.

Although Scotland has an internationally competitive university knowledge base, it has a relatively low wage, low productivity economy. And, although there are some outstanding examples of highly successful research intensive companies in both the bio-medical and in the electronics field, Scottish Industry on the whole is not research intensive and therefore does not pull effectively in the knowledge base. This lack of ‘industrial’ pull on the academic science base has been clearly identified as one of the significant reasons for Scotland’s poor commercialisation rate and, as a consequence, over recent years increasing pressure has been put on universities to play a lead roll in the commercialisation of their research in an attempt to substitute ‘institutional push’ for ‘industry pull’.

My fear is that by concentrating all, or at least a high proportion of our efforts on what in many ways is the easy target, at least as far as politicians and funding bodies are concerned, namely the Universities and HEI’s, we lose sight of what for me is a much more important target, namely how do we reinvigorate the industrial base together with the public and the private sector here in Scotland.

In my view, the most important contribution that a University or HEI can make to the future economic health of the nation is to provide high quality, commercially aware, innovative graduates while at the same time engaging in leading edge research. Lets not forget that, in terms of R and D, without the R the D can rapidly become redundant. The number of high quality graduates produced and the international quality of the research are, in my mind, much better yardsticks than, for example, the number of spin out companies.

Producing high quality, commercially aware graduates and leading edge research are something which essentially only Universities can do and I believe we should focus as much attention as possible on what Universities are uniquely *able* to do rather than what they *might* do.

Let me be clear, I am not saying that academics shouldn’t spin out companies or that Universities shouldn’t engage in applied research, I am merely saying that we need to be careful to get the balance right. One of the first rules, at least in the corporate

world, is to play to your strengths while at the same time recognising your weaknesses.

In terms of encouraging knowledge transfer from our Universities and HEI's, I believe the UK Government made a significant policy error back in the late seventies, early eighties. At a time when, for political and, some would say, ideological reasons, it was effectively reducing the funding going into higher education while requiring colleges and Universities to increase their output of graduates, it started to view knowledge transfer as an alternative funding stream for higher education rather than as an essential component of national economic development. This led to the development, often with ring fenced Funding Council money, of technology transfer offices and commercialisation department within Universities and HEI's. While there are undoubtedly some excellent examples of these offices or departments genuinely promoting knowledge transfer, there are also, I feel, a significant number who seem to view their role in life effectively to act as a gate keeper rather than a welcoming committee and to place as high a price as possible on their IP, seemingly being more concerned with getting a water tight legal agreement than in seeing the technology exploited.

The experience of several major US universities has been that technology transfer is not in general a large revenue generator. Although these universities started out with the aim filling their coffers, they have come to the conclusion that, net of expenses, technology transfer does not, on the whole, generate significant amounts of money for the Institution and, consequently, they are starting to change the emphasis. For example, MIT, Stanford and Yale all now state that their main reason for engaging in technology transfer is to improve the public good – that is to create the greatest possible economic and social benefits from their research, whether they accrue to the university or not.

Again, for the absolute avoidance of doubt, I am not for one moment suggesting that Universities should never seek to commercialise their research through either licensing agreements or indeed spin out companies, nor am I in any way seeking to belittle some of the excellent examples of successful commercialisation which already

exist here in Scotland, I am merely suggesting that we need to put such activities into context and guard against them dominating the knowledge transfer agenda.

Probably one of the most respected writers on competitive strategy and competitive advantage is Michael Porter of Harvard Business School and certainly one of the most authoritative and in-depth studies of what it takes for a nation to be internationally successful in today's world is detailed in his major work 'The Competitive Advantage of Nations' published in the early nineties. Based on in-depth, in-country studies of ten of the world's leading economic nations, Porter and his colleagues concluded that: -

Skilled human resources and knowledge resources are two of the most important factors for upgrading national competitive advantage

For me, the real key to successful knowledge transfer lies in people rather than in legal documentation. I would suggest that the best form of knowledge transfer comes when a talented researcher or graduate moves out of university into business, or indeed vice versa. The more we can do to develop a meaningful and indeed mutually beneficial relationship between academia and business the better. There is absolutely no doubt in my mind that there are real and tangible benefits to be gained by business, the universities and the economy as a whole by improving communications and developing a more trusting approach by all those involved.

As far as I am concerned, *a*, if not *the*, key area of focus should be on persuading corporate Scotland, at all levels from the largest companies to the smallest, to actively make use of the outstanding knowledge resource which is on their doorstep.

In this context I think Knowledge Transfer Partnerships, formally known as the Teaching Company Scheme, is an absolutely outstanding programme. It has been described by various people, including Lord Sainsbury and Richard Lambert, as one of the best mechanisms for technology transfer and I would certainly agree.

There is absolutely no doubt that there are real and tangible benefits to be gained from building close links with Universities and Colleges. In fact, there is a range of data to

show that companies which use Universities and other higher education institutions, as a source of information or as a partner, tend to be significantly more successful than those who do not.

A survey carried out by the DTI and the office of National Statistics across a wide range of companies found that over 80 per cent of those enterprises which had close links to University or HEI had successfully increased the range of their goods and services, opened new markets or increased market share and improved the quality of their goods and services. The equivalent figure for those who did not have such a relationship was just over 40 per cent. In other words half - a fact which, in today's competitive world, those in business ignore at their peril.

And, as the Lambert Review pointed out, there are other benefits to be gained such as:

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- Access to new ideas of all kinds. The best academic researches are truly international in their scope and range of knowledge. The chances are that they will be in touch with knowledge breakthroughs in their areas of speciality wherever they may be happening in the world. At a more local level, HEIs will have expertise and established networks in different departments, which can be a real benefit to a business irrespective of its size.
- The ability to leverage the research dollar. For example Rolls Royce works in partnership with a number of universities across the UK on specific segments of engine technology. These partnerships allow the Company to do much more than if it was working on its own.
- Access to specialised state of the art consultancy tailored to your individual requirements and, most importantly, at a reasonable price.
- The chance to spot and recruit the brightest young talent. Massachusetts Institute of Technology (MIT) believes that one of the motives of those

corporations which invest in its industrial liaison programme is the knowledge that this gives then about the best students who are passing through the system.

As you may have guessed I am, from personal experience and from what I have seen in the wider business community, a real supporter of businesses working closely with Universities and Colleges. It is an area in which there is still much to be done in Scotland and it is a resource which, as I said earlier, business neglects at its peril.

I also believe it is an area in which the Scottish Executive could do more. Although there are some excellent initiatives, such as the proof of concept fund, I sometime feel they are just too many of them and too often they are surrounded with layers of bureaucracy involving government departments or non-department public bodies – in other words quangoes. Assuming you actually know about a particular scheme in the first place, the process of actually getting the support can all too often be just too time consuming and too complex, particularly for hard pressed SME who have enough forms to fill in just to be allowed to do business without starting on another raft of forms, not to mention round of meetings with ‘advisers’ from the various public bodies.

The research tax credit, while a reasonable incentive for those profitable companies to expand their research budgets, doesn’t really encourage new companies, particularly small companies, to take part in research in the first place. Added to which, there is a limited amount the Scottish parliament can do on the tax front. What I would like to see is a process which actually puts cash, or as close as you can get to cash, directly into the hands of all businesses throughout Scotland, but cash that can only be spent on purchasing advice from, or funding research in, a University or College in Scotland. What I have in mind is a sort of voucher system where vouchers are effectively allocated to businesses operating in Scotland on some simple basis, such as, for example, turnover. As I have indicated these vouchers, which would be none transferable, could only be redeemed in partnership with a University or College who would then be reimbursed through the Funding Council. There would clearly be no obligation on business to use the vouchers and they would be designed to lapse after a reasonable period of time. Having said that, most business can’t resist something that

is essentially free and, once they have experienced the benefits, would, I feel sure, want to come back for more. The real advantage would be that HEIs and businesses would be brought into direct contact with no intermediary, however well meaning being involved, and business would be free to choose, clearly in collaboration with the institution, what *they* need for *their* business.

To be meaningful there would need to be a significant allocation of resources to the scheme – say £30 or £40 million per year over a three-year trial period. And, without wishing to be controversial or being seen to criticise what was, at the time, promoted as Scottish Enterprise’s flagship initiative, I have often thought that the similar level of resources dedicated to setting up and funding the Intermediate Technology Institutes, with all their in built bureaucracies and demanding remit of identifying ‘near market research’ which ‘commercial organisations have failed to spot’, could have been better directly put into funding research in the businesses we already have here in Scotland, possibly through a scheme such as the one I have outlined. Added to which, if we did have such a scheme, it would also act as an incentive for research-intensive businesses to locate in Scotland.

I think at that point I will stop. To sum up, I believe we are extremely fortunate in Scotland in having an outstanding HE sector which is capable of giving the nation a real and sustainable competitive edge in the international arena. I also see the Knowledge Partnerships scheme as an excellent vehicle for encouraging business and academia to work together. That said, I also believe that we need to have a much more holistic approach to the challenge of innovating the Scottish Economy and one which is much more business focused. I would also respectfully suggest that clear and decisive leadership from our elected representative in Holyrood would not go amiss in this context. As to the major policy areas, I believe that we need: -

- To address the seemingly inextricable rise in public sector employment and seriously start to promote and encourage private initiative while, at the same time, creating an environment which is really conducive to entrepreneurship and business endeavour within Scotland.

- To seriously promote and encourage, with hard cash, a research culture in existing and indigenous companies while, at the same time encouraging new research-intensive organisations to locate here in and last, but certainly not least,
- To recognise that one of the major contributions the Higher Education sector can make to the future well being of Scotland is to supply of high quality, commercially aware graduates while, at the same time, continuing to engage in world class leading edge research and to reflect these two key components in the future funding arrangements.

C. Masters - May 2006