ESRC Research Project on *Knowledge Transfer in HE in Scotland*

Working Paper 1

REVIEW OF KNOWLEDGE TRANSFER POLICY IN SCOTLAND

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The following paper provides an overview of policies and policy-related developments in relation to knowledge transfer in the Scottish higher education sector. This agenda is currently still emerging, and there are various debates addressing the question of how knowledge transfer should be understood, and the ways in which HEIs, private sector bodies and the wider socio-cultural milieu should engage with it. It will therefore be pertinent to identify key aspects of the relevant policies and policy discussions, and to try to pinpoint areas of established consensus - but also those parts of the agenda where there is tension and divergent viewpoints.

The review is divided into 2 main sections. Firstly, it will be helpful to briefly exam the recent impetuses that can be understood to have led to the rise of the knowledge transfer agenda. Though rarely separate or discrete, it is possible to signal 3 basic sources of influence – all of which are, to a greater or lesser extent, either cited or documented in the policy literature. Each will receive scrutiny, as will the concomitant policies that accompany them. The second half of the discussion will investigate the ways in which the notion of knowledge transfer is presently being interpreted by policy makers, and also the bodies and organisations with an interest in contributing to the agenda. It will be suggested that there are 5 key aspects to the ways in which the agenda is unfolding, some of which are more prevalent and influential than others. It will be important to establish the nature of the assumptions underpinning the various elements of the agenda, and – where appropriate - to link them back to sources of influence identified in the first section.

BACKGROUND TO THE KNOWLEDGE TRANSFER AGENDA

As stated, there appears to be 3 features to the emergence of the KT agenda. To enter a quick caveat here; it should be noted that it is difficult to attribute a precise weight of influence brought to bear by each of the 3 characteristics. Nevertheless, in the first instance, it is surely

necessary to point to the predominance of the idea of the 'knowledge economy.' In recent years, this notion has received much attention from policy makers in various fields, and is readily cited by the Scottish Higher Education Funding Council (SHEFC hereon), in the document *Research and Knowledge Transfer in Scotland* (2002, p2). Here it is stated that:

> *An efficient and productive knowledge economy is one in which commercial organizations have access to a wide range of innovative solutions to exploit market opportunities. Such economies depend upon strong interactions between companies, the knowledge base (HEIs and research institutes), investment finance and entrepreneurial individuals with market awareness, technical knowledge and access to venture capital.*

This view suggests that knowledge should be accorded a degree of importance similar to that of economic capital, when assessing the range and potential of the resources available to societies. The intangible, often abstract and contestable nature of knowledge may not always lend itself to conceptualisation in terms of an economic resource, however. Indeed, and as will become apparent, this one issue alone throws up several of the more pressing dilemmas and difficulties facing the development of appropriate KT policy. At any rate, the Council proceed to elaborate on the nature of the new knowledge-orientated economy, contextualizing it in a global arena, marked by continuous (and continuously more competitive) changes. Suffice to say that higher education is held to have a pivotal role in the processes taking shape here:

> *As part of this process, governments internationally have recognised the dramatic increase in the rate at which new knowledge is translated into commercial innovation in the market and the role of research and skilled graduates in an innovative knowledge economy. This has led to more proactive policies for the involvement of universities in the processes of economic development. The Higher Education Funding Council for England (HEFCE) has developed a "third leg" of funding to promote university involvement in economic development, and SHEFC has established a Knowledge Transfer Grant designed to create infrastructure to support university activity in commercialisation.* (SHEFC, ibid p3)

As its name suggests, the so-called 'third leg' (sometimes also referred to as the 'third mission') funding tranche from HEFCE refers to the view that KT should constitute one of three main activities undertaken by universities, where research, and learning and teaching, comprise the first two.

At this juncture it is perhaps worth pointing out that notions of the knowledge economy are not restricted to KT policy, and have been linked to the first and second 'missions' too. Thus the Scottish Executive asserts a need to view the ever-increasing number of degree holders as providing a vital means of contributing to the newly evolving economy. Nor should this development be interpreted as one which detracts from the acquisition of work-relevant skills:

> *As we move towards a knowledge based economy and the need for an ever more skilled and flexible workforce, higher education has an important role to play in delivering the science, knowledge and skills to sustain this. The vocational nature of*

> *higher education is often undervalued in debates on specific labour market needs – for example, when it is argued that an increase in participation in higher education reduces the level of relevant vocational skills in the population. A significant proportion of higher education is focussed on meeting local and wider labour market needs, on delivering degree and other vocational courses ranging across all industry groups from engineering and construction to hospitality and the performing arts, architectural technology and computing to journalism and communication studies.* (2003, p25)

Succinctly, the argument is for the general 'up-skilling' of the Scottish labour market, which is perceived to be a prerequisite for the creation of a successful knowledge economy. Moreover, the emphasis here will fall on the second of HEIs' 3 missions – that of learning and teaching. Universities must become increasingly focused on the task of providing graduates with new depths and breadths of preparedness for the world of work. This preparedness will not necessarily stem from readily identifiable, course and subject specific skills which will then translate into work-based, task related competencies. Rather, the Executive sees the process in more broad terms, encompassing approaches and aptitudes which will have a significantly wider applicability:

> *Alongside this, there is also a raft of courses available which, while not necessarily demonstrating a direct link to a particular occupation or specialisation, provide learners with transferable skills and abilities which are much valued in the workplace…Vocational skills are about more than specific job-related skills – they are about not only knowledge, but also attitudes and behaviour. A critical need in Scotland is to develop entrepreneurial skills in the workforce. Higher education has a crucial role to play in developing these attitudes, behaviours and skills.* (ibid)

As was signaled in the above introduction, notions of the knowledge economy do not completely monopolise the KT agenda; it contains several strands (although it cannot be assumed that these will be wholly complementary) - a second set of which seem to centre on issues of relevance, ie of the extent to which the research outputs of higher education meet the practical needs of society.

Such considerations will be very familiar to educationalists, a field which in recent years has witnessed a series of prolonged debates regarding the degree to which research does (and should) directly serve the requirements of practitioners. With respect to the KT policy agenda, this issue links to the perceived need to create knowledge which can be used effectively and efficiently – usually in a commercial setting, but also in other domains such as medicine and, to a lesser extent, the arts and humanities. In SHEFC's consultation paper, *Research and the Knowledge Age*, it is argued - in the customary measured terms - that the Research Assessment Exercise (the RAE - the primary means by which HEIs qualify for research funding) has helped to create a situation that has distanced knowledge from the sphere of practical application:

> *The potential relevance of research, or its ability to meet the needs of society, however defined, has not been a major specific objective within the Council's main method of funding research, the RAE-based grant. The operation of this grant has, so*

> *far, enabled activity to be funded in a diverse range of, and indeed most, academic areas.* (SHEFC, 2000, p20)

The Council then identifies a potential problem; if the research funding quantum does not (or cannot) keep pace with the expansion of knowledge production, new pressures will arise, which in turn may lead to the need for reforms to the system of allocation. These reforms may involve revising the criteria by which research is evaluated, and such revisions might seek to include a measure of relevance:

> *Within the scenario of a fixed amount of funding for research, continuing increases in the volume and quality of research undertaken in Scotland will inevitably create funding pressures which will force choices on the Council. In due course, SHEFC will need to consider whether it should spread the existing funds more thinly amongst all research subjects or give priority to some research fields over others. One argument is that the greatest benefit would be achieved by giving a greater degree of priority to areas of research excellence that might be defined as relevant.* (ibid)

It is not too difficult to anticipate the reasons given by the Council for exploring the appropriateness of assessment methods that encompass measures of relevance.

> *The greater emphasis that is being given by the Scottish Executive to the role of the research base in creating a knowledge-based economy suggests that the Council may need to focus more resources on research that has relevance to Scotland's economic, social and cultural needs.* (pp 22-3)

This brings the discussion back to the point made earlier, namely that the KT policy agenda is an ostensibly logical corollary of a belief that knowledge production is more crucial to economic progress than ever before. However, this circularity is not inevitable. It is, of course, possible to be an advocate of reform of the RAE without holding to the belief in the existence of a knowledge economy. Similarly, one could favour such reform, and – more specifically – a type of reform that embraces some measure of relevance, and still reject ideas of a prior transition to a knowledge economy. For these reasons it is helpful to try to keep these two 'drivers' of the KT agenda separate. To clarify, the above review suggests that this agenda is being influenced by two (analytically separable) positions, one that views KT as an essential means of addressing the conditions brought about by the knowledge economy, and a second that seeks to make research more 'relevant.'

In both cases, there is a propensity for KT to be conceived in quite narrow economic terms – knowledge must become increasingly marketable and able to generate financial returns for the higher education sector. This should not be taken to imply that both positions could not (or, indeed, do not) contain strands that act to broaden such a focus. However, it is probably more useful to identify a third element to the background of the KT agenda, one which is far more clearly distinguished by an attempt to explore the potential of KT for wider, more culturally and socially orientated ends. This element will be examined in a moment, but first it should be noted that – in its purest form – it does not constitute 'policy' in the strictest sense. It is probably more accurate to regard it as an ongoing attempt to influence the

development of codified policy and institutional practice, and one which has emerged partly as a reaction to what should probably be regarded as the more dominant, economy-focused aspect of the KT agenda.

Possibly the most concise account of this position is to be found in *The Knowledge Society*, a document drafted by Universities Scotland in 2002. Whilst this publication acknowledges that there is now wide acceptance of the view that economies can gain immense, direct benefit from the creation of new knowledge, it seeks to caution against an overt stress on KT's financial bottom-line:

> *Universities Scotland now wants a new consensus. We want to take these principles – that knowledge will always add value – and apply them more widely. We want to apply them to public policy, to improving civic participation, to creating a fairer Scotland, to our cultural and artistic life and to how we build Scotland in the world community. Our goal is to create a Knowledge Society where learning, understanding, creativity and ideas add value to everything.* (2002, p1)

It should be apparent that this signifies a rather different approach to KT, certainly with respect to the way in which it prioritises the notion of society, as distinct from economy, ie It may follow that KT harnessed to the objective of a knowledge society requires a distinctly different set of policies than one where KT aims at servicing (or helping to establish) a knowledge economy. These and related issues can be more fruitfully explored by looking squarely at the ways in which the KT agenda is being interpreted in policy documents, for while the above has touched on this question, it has not addressed it in any depth.

In summary then, the background to the emergence of the KT policy agenda is one that encompasses several perspectives, and whilst the above does not comprise an exhaustive list, it has hopefully signaled the more prominent and active components. As was seen, these components may not always be as discrete and singular as was implied, but this does not mean they should not be kept analytically separate. For example, such a separation should permit a more trouble-free assessment of the interests and intentions behind a given policy proposal, and make it more possible to evaluate various weights of influence. In any case, it has been suggested that the KT background consists of 3 main elements; a perceived need to meet the requirements of new knowledge economy, a drive to reform existing methods of assessing the quality and nature of research, and – thirdly – a desire to ensure that social and civic spheres benefit from the knowledge production undertaken in HEIs.

How is the KT agenda being interpreted?

There are arguably 5 facets to the way in which the KT agenda is currently being interpreted. This is complicated by the fact that the notion of KT itself is not necessarily a consensual idea. For, although terminologically conjoined, both terms can act as subheadings for different ideas, some of which may not 'hang together' in an altogether harmonious fashion. In many ways, this goes without saying for the first of the two terms; what constitutes 'knowledge' has, of course, been subject to concentrated debate in the west since the times of

Ancient Greece. But, less glibly, it can be suggested that in the KT context (and, more pertinently, with respect to KT developed in relation to reductionist perspectives on the knowledge economy), there may be a temptation to conceive of knowledge as something more akin to 'information.' This is a relatively neutral and trouble-free notion. After all, information seems to possess more stable qualities, being more easily 'packaged.' Crudely put, it is a more streamlined, speedy and conveyable phenomenon. Needless to say, these qualities will be of particular interest to those parties seeking to enhance the efficiency and responsiveness of the knowledge production process.

By contrast, knowledge proper is potentially far more difficult to 'handle' – particularly if it is not of a technological nature. Depending on the epistemological viewpoint adopted (and much does depend on this), knowledge can be understood as more of a verb than a noun. In this sense, it becomes a continual process, and one that is therefore insusceptible to being broken down into chunks and packages, to be parceled up and shipped out. The messiness of this process-based view may be further complicated if knowledge is understood as a dialogical activity which attempts to draw in contributions from various provenances. Understood thus, knowledge appears as a decidedly inefficient procedure. Indeed, it could be argued that the criterion of efficiency (however it may be understood) is wholly inappropriate to the assessment of knowledge properly conceived.

So much, then, for the 'K' part of KT. As has been implied in the above, the 'transfer' aspect of KT is also not exempt from problems of definition and interpretation. In the first instance, 'transfer' can infer a linear, one-way type of movement – which in turn suggest a particular (and perhaps overly simple) model of dissemination. Although this might be appropriate for information, and even technological insights, it is arguably less appropriate for other forms of knowledge, such as those emanating from social sciences.

Some models of research, eg action research, are predicated on iterative procedures, where knowledge is understood as more of a cyclical process, probably incorporating moments of critical reflection and on-going theoretical refinement. Of course, all properly established modes of academic investigation will seek to be critically reflective and to refine their theories. However, in the social sciences, these aspects of knowledge production can be far more definitive – perhaps because of some researchers' commitments to certain ontological and epistemological positions, or else because of differences in the problematic of these fields of inquiry. At any rate, the appropriateness of a commonsensical, 'sender / receiver' type model of transfer could possibly benefit from some close scrutiny.

This preamble should, if nothing else, serve as preparation for an examination of the ways in which KT policy is presently being interpreted. It should also signal the fact that, if even these ostensibly rudimentary terms are capable of multiple (and possibly quite divergent) interpretations, it is reasonable to anticipate a still wider range of meanings arising as they become subject to the vagaries of policy development and documentation.

As stated, current KT policy appears to contain at least 5 aspects, although it may well be the case that no one document states each of these explicitly. However, this cannot be taken to discount the possibility that a particular aspect may come to exercise influence over the way in which KT policy will evolve in a more general way in the near future. For this and related reasons it is perhaps best to try to examine them separately, as far as it is possible to do so.

i) KT should be 'strategic'

The notion of a strategy, and of a strategic approach to activity, has become something of a given in contemporary higher education – and probably the public sector more generally. At times it seems to function as something of a floating signifier, or portmanteau term capable of indicating an extremely wide variety of meanings and practices. Commenting on the possible re-shaping of the Scottish HE sector, and its research activity, the Executive states that "There is already a huge amount of effort underway to make progress on strategic use of resources, both within Scotland and at a UK and EU level," (2003, p43). Elsewhere in this document, the reader encounters the idea of 'strategic dialogue:'

> *SHEFC's Strategic Dialogue Process is a new agreement between SHEFC, Chairs and Principals of HEIs and Universities Scotland, which offers an opportunity for the sector to employ its knowledge and expertise collectively to develop coherent sector strategies. Early priorities have been identified as: Leadership & Management; e-learning; Widening participation; Excellence in Teaching and Knowledge Transfer.* (SE 2003 p13)

Could this usage simply be substituted with the word 'plans' (or, in the former quote, 'planned')? On one level it would seem so. However, a more subtle meaning is present, incorporating notions of efficiency, ie out-put maximizing, and return-generating. With respect to the policies developed by SHEFC, and in turn, the KT context, 'strategy' appears to signal a process which may serve to erode distinctions between the public and private sectors, whilst also retaining a direct focus on structural and economic development:

> *A second stream of funding would be for specific projects designed to fund strategic priorities. These might include the creation of "intermediate institutions" in key areas; university links with inwardly investing companies designed to develop research-intensive business activity; systematic engagement with indigenous SMEs designed to improve their innovative capacity; the creation of strategic infrastructure etc.* (SHEFC p16)

Such 'intermediate institutions' seem to be a form of hybrid organization which will consist of publicly funded research capabilities and the commercial expertise most commonly associated with private businesses. Taken in conjunction, these notions of the 'strategic' paint a quite familiar picture, and one in which the emphasis falls upon improving the performance of government financed institutions, and encouraging them to become more aware of the thinking and practices of commerce. It is a picture in which processes move with increased velocity, and become continuously responsive to external demands – although the meaning of

'external' seems likely to acquire an increasing degree of opacity in this case (because the boundaries of the two sectors will blur).

One question arising here relates to the extent to which a strategic approach to KT must also be one that is concentrated on the economic aspects of this agenda. Turning to view the Universities Scotland use of the term, it would seem that a more broad view does *not* preclude the adoption of a strategic approach. In a response to the Executive's policy proposals for Scottish HE, the following remarks are made:

> *We believe that this offers the best chance for a generation to set a strategic direction for higher education in Scotland. Involving many partners, we want that strategy to build a knowledge society with higher education at the heart.* (Universities Scotland, 2002, p1)

These approbatory comments are immediately followed by a far more circumspect set of views, however. Universities Scotland proceed to reflect critically on the potentially control orientated elements of the Council's conception of a KT strategy. The former's concerns centre on the desire to maintain the breadth and depth of free academic inquiry, dimensions which may be constricted in an atmosphere where efficiency and narrow applicability become the main criteria of assessment. More specifically, it is seen to be a matter of more carefully defining which parts of the research process are most appropriately conceived in a 'strategic' sense. It may be that such criteria are best applied to the latter stages of research, keeping the primary phases as unconstrained as possible:

> *Any strategy for knowledge cannot be about planning what to explore and what not to explore or about guessing what is worthwhile and what is not. The history of learning and discovery shows that it is best to set teachers and thinkers free to make the discoveries. Applied research and solving specific problems will always be important for our academics, but restricting what they can explore or how they will explore it will only restrict our horizons. Creativity must be encouraged and supported even where we cannot see immediate results. But that does not mean we cannot be strategic. We must prepare the ground to enable people to 'go see'. We can set the conditions which will help to stimulate and support the activities which will contribute to a knowledge society. And we can be strategic about how we deal with outcomes. If it is impossible to know exactly what will result from the 'go see' approach, it is not impossible to prepare to make the most of whatever opportunities do appear.* (ibid)

One of the key dilemmas of workable strategic KT policies therefore rests on the issue of timescales. The difficulty lies in designing a process that is capable of taking advantage of opportunities that may arise in the short-term, without impinging on the need to sustain spaces for creativity, invention and exploration. By definition, such activities will require a more long-term vision, and unrestrained environments. Nor should higher education be allowed to become, in the words of Universities Scotland, 'risk averse:'

> *A longer term funding horizon which is less risk-averse could remove the pressure on universities to make short-term gains from their intellectual property (IP) at the expense of a potentially more effective long-term approach.* (ibid, p16)

ii) KT must be a measurable process

The question of the extent to which KT requires some form of evaluation and measurement arises largely in the context of a specific KT policy, namely the Knowledge Transfer Grant. This is, essentially, a stream of funding created by SHEFC in 2003. According to the Executive (cited below), the priorities in developing a suitable 'metric' should focus on the extent to which KT activity generates financial returns. Secondly, as the reference to 'human resource practice' shows, measurements should also be able to report on how staffing arrangements can be managed. This may relate to a concern that the introduction of a 'third mission' may place undue strain on existing staff, leading to resistance or attrition. Similarly, it could signal an awareness that academic researchers do not possess (nor seek to possess) the skills to work in a quasi-commercial capacity – thus producing a demand for new kinds of staff.

> *As part of the overall additional funding for science and research announced in SR2002 (we will) enable SHEFC by 2005-06 to increase resources by at least 100% (from the current baseline of £6 million) for investment in knowledge transfer grant (KTG), providing incentives for much more intensive interactions between HE and business. KTG is being reviewed by SHEFC with the aim of incorporating a range of suitable metrics to help drive and share best practice in commercialisation. As part of this review, we will also ask SHEFC to consider how KTG might be used to help stimulate human resource practices which better support knowledge transfer activities.* (Scottish Executive, 2003, p48)

In one sense it is ironic that the Executive has sought to place the issue of metrics on the KT policy agenda, for whilst it is necessary to monitor investment and activity in this area, according to some measurements KT by Scottish HE already has an excellent record. Comparative research conducted at Edinburgh University reports that Scottish Universities out-perform American HEIs in the context of exploiting new knowledge for commercial gain. Thus Scottish institutions create one company for each $20m of research funding, against an average of one per $77m for the top 11 US HEIs (Snaith, 2002).

There is also the issue of what criteria are most appropriate for assessing KT activity – a question which will inevitably be posed, given the competing interests in the field. Universities Scotland have stated that currently '…metrics and the analysis of them are not sophisticated enough to provide higher education managers with the information they need,' (Universities Scotland, 2002, p10). This body has established a group to scrutinise current practices. It should therefore be concluded that the debate surrounding KT metrics (including what criteria should be used, and – more fundamentally – how this should be decided) is still underway.

iii) KT will require different approaches

Although the view that there should be a pluralistic approach to KT activities may seem a somewhat bland statement, it could lead to the creation of policies - and the implementation

of practices - that provoke serious exchanges between government, institutions and funders. This is because, at present, KT policy is being developed to take account of what are perceived to be institutionally specific characteristics. Such a policy will, in turn, have an impact upon the structure of the Scottish HE sector more generally.

> *The spectrum of knowledge transfer activities could be expected to vary from university to university in ways that reflect their individual strengths. Whilst start-up, spin-out and licensing could be expected to be pursued by all institutions, other strategic objectives might reflect individual strengths. For example, internationally competitive research groups would be the obvious ones through which to attract research intensive inward investment, and given the tradition of local engagement in many post-'92 universities, interactions with SMEs might be a key focus for their research* (SHEFC, 2002, p10)

From this statement it is clear that the Council seeks to bifurcate the nature of much KT activity – and this despite the potentially misleading use of the term 'individual strengths,' which implies a plurality belied by the subsequent comments. The 'ancient' and 'old' HEIs will be expected to remain (or become) involved in KT at the global level, whilst the new institutions are to be much more regionally orientated. Aside from the potential difficulties associated with creating a divided and stratified '2 tier' sector (entrenching elite structures, and cementing a lower rank of 'less worthy' institutions), this may create tensions with other objectives, such as those stated by the Executive:

> *The diversity which already exists amongst institutions should be a strength which makes it easier, not harder, to deliver agreed national priorities across the sector as a whole, and to develop collaborative working within and across disciplines and institutions, wherever there are benefits to be gained.* (Scottish Executive, 2003, p10)

The problem here is that existing diversity may be eroded by the binary structure cited in the previous policy. Whilst this need not necessarily mean collaboration will fail to occur in the KT context, such an outcome would probably serve to restrict collaborative activity to arrangements between institutions of like status – ie the old with the old and the new with the new. A more progressive approach could encourage the best to collaborate with their 'younger' counterparts in a bid to ensure that all institutions become excellent, and skilled in undertaking KT at numerous levels.

iv) KT activity as a commercial endeavour

As has already been noted in the first section of the discussion, much current KT policy – and activity – focuses on the commercial potential of research. Such is the notion of KT fit for the purpose of meeting the needs of the knowledge economy. At any rate, it would not be an overstatement to suggest that, in the most powerful parts of the policy making arena, there is an overt tendency to interpret KT in terms of the financial gains it can generate for the sector generally, and institutions specifically. With regard to already established and ongoing policy there are numerous initiatives devoted to extracting saleable research findings and

innovations – most of which have a scientific or technological emphasis. They include Faraday Partnerships, Company Development Scheme, Grow Your Business with Graduates, Training for Innovation Programme, Scottish Enterprise (made up of 12 'Local Enterprise Companies'), the Teaching Companies Scheme, and Knowledge Transfer Partnerships. Faraday Partnerships specialise in 'technology translation,' and draw on private, UK government and European funding. The Local Enterprise Companies - beneath the umbrella of Scottish Enterprise - share similar aims to the Faraday Partnerships, but perhaps service a broader spectrum of commerce, and also step over into the realm of training and skills development. With respect to the Teaching Companies Scheme and Knowledge Transfer Partnerships, the former (established by the DTI in 1975) has recently tended to become subsumed beneath the latter. Both initiatives place an emphasis on forging links between universities and private enterprise, and as such, are possibly the most relevant to KT policy as examined here.

Inevitably, the heavy stress on the commercial dimension of KT will have an impact on key aspects of HE, including students and university staff. According to a 'joint task group' consisting of the SHEFC and Scottish Enterprise, "There are strong arguments for encouraging HEIs to provide graduates with a type of 'commercial skill kit' so that they have confidence to become self-employed or be more attractive to SMEs as employees," (SHEFC and SE, 2002, p28). This will serve to build on the more familiar notion of transferable skills, although it is not yet clear how far these pressures will come to constrain the breadth of the university curriculum. One way forward might be to provide such 'skill kits' in the form of optional modules, allowing students with more commercially minded dispositions to pursue their interests, whilst those with more 'pure' or theoretical preferences could side-step them. With respect to staffing, the task group plans to make KT play a part in academic career pathways, and proposes to create various new roles and posts to support commercially aimed research:

> *Universities involved in these processes should be expected to make a strong corporate commitment to knowledge transfer by ensuring that incentives are in place for individual academics, including the acceptance of "knowledge transfer" as a criterion for promotion, and a shift in the approach of university commercialisation departments towards business development, with appropriate infrastructure and personnel.* (ibid, pii)

To reiterate, the general weight of emphasis in much current KT falls on technological and scientific forms of research. The assumption is that the new knowledge economy places heavy demands on such research, and that links between universities and commerce can be produced most fruitfully by attempting to create a supply and demand relationship between these two spheres. In Scotland (and elsewhere) this thinking exists in various arenas of policy making, from the regional, through national and to the European level. At this latter level, there have been various attempts to draw together the research capacities of the 15 nation states. Initially, the European Commission had 15 individual (national) programmes of research – with certain shared priorities, though more recently however, the creation of a

Framework Programme (now in its 6th phase) has tried to unify the separate strands in a bid to avoid duplication of efforts, etc. More pertinently for present purposes, though, is the list of research 'priority themes' contained within the Programme:

- Life sciences, genomics and biotechnology for health
- Information Society Technologies (IST)
- Nanotechnologies and nanosciences, knowledge-based multifunctional materials, and new production processes and devices
- Aeronautics and space
- Food quality and safety
- Sustainable development, global change, and ecosystems
- Citizens and governance in a knowledge-based society

There is obviously a significant stress upon technological and scientific types of research here, although it is interesting to note in passing that the seventh theme does employ the term 'knowledge society,' as distinct from that of 'knowledge economy,' ie To a large extent this focus is echoed at the national level. At present possibly the most prominent KT policies emanate from the Department of Trade and Industry, largely under the banner of the Technology Programme – which is split into two strands, Collaborative Research and Development, and Knowledge Transfer Networks. The perceived need to make universities more responsive to businesses also received emphatic endorsement from the Lambert Review of 2003 (undertaken by the DTI), which also reported that – currently – funding streams do not encourage the less high-status HEIs from making links with businesses.

Various concerns have been expressed regarding this stress. In a response to the Scottish Executive's second stage of consultation (preceding the Scottish Executive Higher Education Review), the National Postgraduate Committee (NPC) made the following statement:

> *We trust the Executive will consider the possible impact on academic freedom caused by increased commercialisation in research. Principles need to be laid down on issues such as conflict of interest and commercial confidentiality. Important areas of research should not go unfunded simply because of a lack of a commercial partner.* (NPC, 2002)

It is possible that, in a milieu where the boundaries between academic and commercial research become eroded, the 'second mission' (ie learning and teaching) of HEIs will become compromised. For example, if a given partnership between a company and a university department produces an exploitable evidence base or technological breakthrough, there is the likelihood that the partnership will claim ownership of it. However, in the more established procedures of research and dissemination, the accepted practice is that knowledge is made public, both through publications and by passing it on to students in the sphere of learning and teaching. These latter processes may be curtailed, or at least subject to regulation, where questions of ownership and control arise. This is just one instance of a possible 'conflict of interest' that may emerge in relation to commercial KT. The final point made by the NPC in the above statement is no less important, and links to these subsequent remarks:

> *Too often the phrase "knowledge transfer" is only applied to the natural sciences and technology. We hope the Executive will pay proper regard to the positive impact that the arts and humanities have on the economy, via the cultural and tourist industries.* (NPC, ibid)

This belief that the current KT policy agenda may exclude other disciplines and subject areas is also identified by Universities Scotland. The point is a valid one and does raise the question of what cultural and social backdrops have led to the assumption that science and technology are deserved of the lion's share of experts' and policy makers' attention. Universities Scotland signal the latent capacities of the social sciences too:

> *The commercialisation agenda is very closely linked in many people's minds with the 'Tomorrow's World' vision of science and technology. This is of course where much of Scotland's most valuable commercialisation springs from, but the potential to commercialise from the creative arts research base, or even from within the humanities and social sciences, is also great. The contribution of the creative industries to the Scottish economy is substantial and it is important not to lose sight of further opportunities for commercialisation in this area.* (Universities Scotland, 2002, p10)

This leads the discussion to the fifth way in which the KT agenda is being interpreted in contemporary policy, namely a civic sense. As may be evident from the above, the commercial take on KT *is* dominant, but this does not mean that the agenda cannot be encouraged to accommodate other perspectives and objectives.

v) KT's civic potential

On one level, it might be expected that the civic potential of KT would be more conspicuous in Scottish policy, – home of Adam Ferguson, the earliest exponent of the concept of civil society. It could also be argued that successful, sustainable economic development is not possible without a parallel enrichment of social conditions. There is, however, apparently an overhanging legacy of neo-liberal economic policies in much current thinking, including that of the notion of the knowledge economy. The assumption seems to be that if wealth can be created, by developing new technological breakthroughs and ensuring that, if companies can 'pull through' these products, then prosperity will eventually trickle down. But, even if wealth does possess such liquefacient properties, this is no reason to neglect the requirements of civil society in the meantime.

This is not to suggest that, in policy documents at the highest levels, there is a complete lack of awareness of a civic and social role for KT. As the following extract from *A Framework for Higher Education in Scotland* shows, policy makers within the Scottish Executive do display an awareness of its place and purpose:

> *While there is rightly a focus on technology transfer into the wider economy, the exploitation of social science research too plays a vital role in helping to improve quality of life and improving social justice. Similarly, the commercialisation of research in creative disciplines, such as design and creative content for a whole*

> *range of media, brings cultural, social, and economic benefits and produces a highly visible international profile for Scotland.* (Scottish Executive, p41)

Nevertheless, this awareness is often of a somewhat benign nature and rarely appears to translate into a willingness to think in proactive terms, which can lead to the relegation of KT's social dimension. Evidence for this can be seen in statements from the Joint Task Group, made up of SHEFC and Scottish Enterprise, which call for:

> *...recognition of and respect for universities' other roles in creating, re-assessing and transmitting knowledge for the benefit of individuals and society in cultural and social terms. It is important to respect these in promoting universities' contributions to economic development.* (SHEFC & SE Joint Task Group, 2002, p18)

Whilst 'recognition' and 'respect' for these other functions will be welcomed by those active in these fields, it is not apparent why the framing of an approach to KT which accords equal weight to economic and social development is so problematic. Perhaps there is some quality inherent in this form of knowledge – its 'stickiness,' eg Alternatively, the difficulty may lie in the methods of dissemination and promulgation employed by the social sciences, in that the they are not of a linear nature. Maybe the idea of 'transfer,' no matter how it is conceptualised, is inappropriate to the nature of research and knowledge production in the social sciences. For those with an interest in extending the influence of these subjects these are surely some of the more pressing questions in the relation to KT policy.

CONCLUDING COMMENTS

This review of KT policy in Scotland has sought to examine the background to the agenda, and also the key ways in which it is presently being interpreted. It was suggested that notions of the knowledge economy have been extremely influential, but also that other pressures have been exerted, such as a more general attempt to reform the ways in which research is assessed (including calls to make knowledge more applicable and relevant), and a desire to ensure that KT incorporates a civic dimension. This background inevitably comes to inform the ways in which the task of KT is currently being interpreted and formulated into institutional policy, a set of considerations which were addressed in the second half of the review. To recap, KT is to be a 'strategic' activity – one that should be rapid enough to take full advantage of quickly emerging opportunities, and to pinpoint the demands of commerce, at local, regional and global levels (depending on status and type of institution). This is, to some extent, balanced by the counterweight of pressures to sustain a space that is sheltered from the bustle of business, where creative, imaginary and critical thinking can take place. A second take on KT accords much significance to the issue of measurability and 'metrics,' although the question of appropriate criteria has yet to be decided in full. A third strand asserts a need to take institutional differences into account, which is reflected in the two streams of funding contained within SHEFC's Knowledge Transfer Grant. The degree to which these measures will compound sectoral stratification, and lead to a 2-teir system of Scottish HE must remain

a moot point. Finally, there is the duality of the economic and the social perspectives. Whilst the former is dominant, the second is not without support and may yet come to exercise further influence over the way in which KT policy continues to develop.

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