

modern oo

EUROPEAN PLATFORM
HIGHER EDUCATION MODERNISATION

**TOWARDS A STRATEGIC MANAGEMENT AGENDA FOR
UNIVERSITY KNOWLEDGE EXCHANGE**



EUROPEAN CENTRE FOR STRATEGIC
MANAGEMENT OF UNIVERSITIES

TOWARDS A STRATEGIC MANAGEMENT AGENDA FOR UNIVERSITY KNOWLEDGE EXCHANGE

The MODERN project is carried out with the support of the European Commission. The content of this report reflects the views only of the authors and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Lifelong Learning Project N° 142354-LLP-1-2008-1-BE-ERASMUS-ENW

Contact
ESMU
Rue Montoyer 31
1000 Brussels

© 2011 ESMU

www.highereducationmanagement.eu
e-mail: nadine.burquel@esmu.be

All rights reserved. No reproduction or copy of this publication may be made without written permission.

**TOWARDS A STRATEGIC
MANAGEMENT AGENDA FOR
UNIVERSITY KNOWLEDGE EXCHANGE**

PAUL BENNEWORTH
CENTER FOR HIGHER EDUCATION
POLICY STUDIES
UNIVERSITY OF TWENTE
THE NETHERLANDS

ASSOCIATE PARTNER ORGANIZATIONS

- › Association of Heads of University Administration (AHUA)
- › Baltic Sea Region University Network (BSRUN)
- › Central European University (CEU)
- › Centre for Higher Education Management and Policy at Southampton (CHEMPaS)
- › Compostela Group of Universities (CGU)
- › Danube Rectors' Conference (DRC)
- › Deans' European and Academics Network (DEAN)
- › ESMU-HUMANE Winter School Alumni Network (WSAN)
- › European Association of Conservatoires (EAC)
- › European Association of Distance Education Universities (EADTU)
- › European Association of Institutions in Higher Education (EURASHE)
- › European Network for Universities of Applied Sciences (UASNET)
- › European Society for Engineering Education (SEFI)
- › European Universities Public Relations and Information Officers (EUPRIO)
- › European University Institute (EUI)
- › Fachhochschule Osnabrück
- › Hochschul-Informationssystem (HIS)
- › Heads of University Management and Administration Network in Europe (HUMANE)
- › Association for European Life Science Universities (ICA)
- › Institutional Management in Higher Education (OECD-IMHE)
- › Network of Universities from the Capitals of Europe (UNICA)
- › ProTon Europe
- › Santander Group of European Universities
- › UNESCO-CEPES, European Center for Higher Education
- › The European Higher Education Society (EAIR)
- › The Norwegian Association of Higher Education Institutions (UHR)
- › Universidad Politécnica de Valencia, Center for the Study of Higher Education Management (CEGES)
- › University of Kassel, International Centre for Higher Education Research (INCHER)
- › University of London, Institute of Education (IoE)
- › University of Oldenburg
- › University of Southern Denmark



TABLE OF CONTENTS

The MODERN project	7
1. Introduction	8
1.1 The structure of this report	9
2. What is knowledge exchange (and is not)	10
2.1 Knowledge exchange is not specifically about the third mission	10
2.2 Knowledge exchange is a style of handling knowledge circulation processes	11
3. Knowledge exchange and university modernisation	13
3.1 University Modernisation and the MODERN project	13
3.2 University tensions around knowledge exchange	14
3.3 Knowledge exchange in an age of new public management	15
3.4 Importance of resolving the knowledge exchange dilemma	16
4. Knowledge exchange in a knowledge society context	19
4.1 External pressures: the rise of mode two and the Triple Helix?	19
4.2 Internal pressures: strategic management of diverse actors	21
4.3 Knowledge exchange and university strategic management	22
5. Three rationales for university knowledge exchange	26
5.1 The intrinsic rationale for knowledge exchange by universities	26
5.2 The extrinsic rationale for knowledge exchange by universities	27
5.3 The narrative rationale for knowledge exchange by universities	28
6. Operationalising knowledge exchange: a stakeholder approach	30
6.1 Who has an interest in university knowledge exchange?	30
6.2 Why do universities respond to outside partners?	31
6.3 What kinds of activities might knowledge exchange involve?	32
7. Knowledge exchange through mutual benefit	34
7.1 Knowledge exchange as mutual dependence between universities and other actors	34
7.2 Enduring relationships and shared-self interest	35
8. Conclusion: clarity in knowledge exchange process	38
9. Bibliography	40
10. Appendices	44
Appendix 1. A hierarchy of university knowledge exchange activities	44
Appendix 2. Definitions of university/community engagement	45

THE MODERN PROJECT

In its recent Europe 2020 strategy, the European Commission emphasised the need to enhance the performance and international attractiveness of Europe's higher education institutions. European higher education institutions need to modernise their governance and train their leaders to operate in increasingly complex sets of interactions at the institutional, regional, national and European level. European policies call for universities to play a strong role in the EU 2020 strategy and in making Europe a strong knowledge-based economy. Although the need to train university leaders is so obvious, the supply of management support to higher education institutions, their leaders and managers is highly fragmented in Europe.

The MODERN project, European Platform Higher Education Modernisation (www.highereducation-management.eu), is creating an open platform as a key instrument for innovation, state-of-the-art knowledge, dissemination of good practice and joint action on university leadership, governance and management for the professionalisation of the sector. MODERN contributes to raising awareness in European higher education institutions on the strong need to invest in people, to support potential leaders, and to encourage management training at all levels (junior and senior, academic and administrative staff), with as background the aim to ensure their competitiveness to respond to external challenges.

Under the leadership of ESMU, the European Centre for Strategic Management of Universities, MODERN is a consortium of 10 core and 31 associate partners joining forces through a Structural Network under the EU Lifelong Learning Programme (ERASMUS). All project partners are institutions and associations active in the field of higher education management.

During the three years of the project (2008-2011), MODERN will map the supply of management development programmes and its adequacy to the demand, leading to the creation of a European portfolio of the provision of short and long term training programmes in higher education institutions and European associations.

The present report is the fifth in a series of thematic reports which are published on key issues related to current priorities in higher education management: governance, funding, internationalisation and quality assurance, regional innovation, and knowledge exchange. This fifth report provides an overview of the state-of-the-art of knowledge exchange. The report was written by Paul Benneworth, CHEPS, Center for Higher Education Policies, University of Twente, MODERN project partner.

The MODERN project does further respond to the need for training in higher education by conducting a series of peer learning activities. These serve as pilot initiatives to develop new offers for both higher education institutions and their individual leaders.

I would like to thank all our partners in the MODERN project for their valuable contributions in developing our European platform. It is with their strong support and significant expertise that we are together, during the three years of the project, building a powerful tool to support the modernisation agenda and the further professionalisation of higher education in Europe.

Frans van Vught
ESMU President
MODERN project leader
June 2011

1. INTRODUCTION

The increasing importance of knowledge presents a great opportunity for universities and higher education institutions (HEIs). In the last century, universities have evolved from training schools for the elite to a common experience shared amongst a significant proportion – if not a majority of the population. This has coincided with a set of changes in society and the economy at large which has seen knowledge become increasingly valuable. The contemporary institution of university therefore owes its existence to this ability to create useful knowledge for the wider benefit of society. The success of universities into the future is likewise likely to depend on universities' capacities to produce and disseminate useful knowledge.

As universities have become increasingly important in society, governments have begun to pay increasing amounts of attention to what universities do and the way they are run. With higher education consuming increasing proportions of national wealth, policy-makers and governments are seriously asking the question of whether they are getting good value for money. A series of reforms in recent years have attempted to give universities the autonomy to innovate and compete in order to improve their overall efficiency. Payment-by-results, competition for students and grants, student mobility and increased enterprise are all techniques used to try to make universities more sensitive to societal demands and needs (CHEPS et al., 2009). The nature of these changes is neatly summarised by OECD, which argues that they have ultimately been about increasing oversight over the sector whilst providing the freedom to contribute to these multiple missions.

In the governance of tertiary education, the ultimate objective of educational authorities as the guardians of public interest is to ensure that public resources are efficiently spent by [universities] to societal purposes. There is the expectation that institutions are to contribute to the economic and social goals of countries. This is a mixture of many demands, such as: quality of teaching and learning defined in new ways including greater relevance to learner and labour market needs; research and development feeding into business and community development; contributing to internationalisation and international competitiveness" (OECD, 2008, p. 13).

Governments have attempted to use these tools to increase universities' wider societal contributions, increasingly so as knowledge economy rhetoric has become increasingly incorporated into the policy mainstream (Commission, 2010). It is now commonplace to talk of the idea of a 'third mission' for universities alongside their teaching and research activities, contributing to social, economic and cultural as much as to academic development (e.g. Quotec, 2009). Jongbloed (2007) highlights a proliferation of attempts by governments, academics, learned societies and think-tanks to develop indicators and measures for this third mission.

The U-Map (2008) and U-Multirank (2010) projects have devoted substantial effort in trying to develop effective measures for ranking and profiling universities according to this third mission output.

By demonstrating that these benefits are created, universities satisfy governments and their other key funders, and avoid the onerous imposition of targets and measures that risk distract universities from their main missions. What has been noteworthy about these efforts is the fact that there has been no unanimity about constitutive effective measures for the third mission. The problem is in part definitional around the idea of a third mission. If the third mission is defined as the social and economic impacts of universities, then an important part of that mission is delivered through their core activities, by generating new knowledge and teaching that into students, who take that knowledge with them upon graduation. We argue that this reflects the much deeper problem in that there is no agreement as to the nature of this third mission, which in turn makes it much harder to define, incentivise and measure excellence in the third mission.

1.1 THE STRUCTURE OF THIS REPORT

This report attempts to provide a clear framework for understanding universities' knowledge exchange activities through the gamut of activities in which they are involved. Rather than attempt to measure the downstream benefits, it is instead more sensible to look at the ways in which universities interface with society (DG RESEARCH, 2009). 'Knowledge exchange' is a process through which universities interact with the world at large to ground their knowledge in reality. The emblematic form of knowledge exchange in a university is between teacher and student; the teacher acquires novel knowledge through scholarship and research, and teaches it to the student, who takes it into the wider world.

But knowledge exchange goes beyond the teacher-student relationship, to a much wider set of relationships. Effectively understanding knowledge exchange requires understanding this wider set of relationships. This report therefore seeks to understand knowledge exchange, and in particular, how knowledge exchange works in the interests of the institution and its key stakeholders. It is important to stress that this report is not restricted to ideas of the third mission, regional engagement or any other peripheral university purpose, but extends squarely to universities' core business of universities, and understanding how universities can manage those core businesses (teaching and research) to deliver wider societal benefits.

This report provides a conceptual framework for understanding knowledge exchange in order to help institutional efforts to create a strategic agenda for societal engagement. The report starts by setting out the knowledge exchange challenge for universities, which is managing a process which defies simple focus.

Simply put, knowledge exchange lies at the heart of everything that universities do; at the same time, its cross-cutting nature can lead to its neglect in favour of more obvious, measurable and manageable missions. The report places this problem into context, then creates a framework for it in an age emphasising university management based on strategic focus, clarity, efficiency and accountability.

The report therefore has the following structure:

- Chapter 2: the problem of knowledge exchange as a ubiquitous, overlooked activity
- Chapter 3: the desirability of knowledge exchange activity by universities
- Chapter 4: towards a pragmatic definition of knowledge exchange
- Chapter 5: understanding why universities would exchange their knowledge
- Chapter 6: understanding why other actors would exchange their knowledge
- Chapter 7: mutual dependence as a basis for knowledge exchange activities
- Chapter 8: knowledge exchange meeting multiple goals through shared-self interest projects.

2. WHAT IS KNOWLEDGE EXCHANGE (AND IS NOT)

Knowledge exchange is at the heart of university business, and its better management is vital for better university management. Managing knowledge exchange better requires understanding what knowledge exchange is, where it is taking place, the mechanisms where it occurs and its underlying logic. To date, understandings of knowledge exchange have largely been assumed or taken-for-granted. This raises the problem that when there are tensions and conflicts, knowledge exchange is invisible. It is therefore necessary to specify precisely what exactly in knowledge exchange, and how it fits with the general repertoire of university missions, behaviours and strategies.

Knowledge exchange is – very simply defined – where universities create and circulate knowledge, involving other partners in those creation and circulation processes. Knowledge exchange is not something new, because universities have never been the only sources of knowledge in society. Universities have for various reasons throughout history interacted with other groupings to access their proprietary knowledge, to improve the understandings of the world. Knowledge exchange can be regarded as a foundational principle of universities: without knowledge exchange, researchers become solipsistic, self-referential and ultimately weaker, whilst teaching quickly becomes out-of-date.

But properly understanding knowledge exchange faces a challenge from the fact that it is often grouped within a set of cognate concepts which suggest that knowledge exchange is in fact something new for universities. This has the effect of making knowledge exchange seem far more normative, optional and contentious than a necessary foundation of the institution of university. Universities cannot function without effective knowledge exchange, which is where a whole range of knowledge exchange relationships are held together in a single institution. This section clarifies some of this definitional confusion by first setting out what knowledge exchange is not, before turning to look at what it is.

2.1 KNOWLEDGE EXCHANGE IS NOT SPECIFICALLY ABOUT THE THIRD MISSION

In 1982, the Centre for Educational Research and Innovation (CERI) at the Organisation for Economic Co-operation and Development published a landmark report on university relationships with different types of communities, notably business and society. This was a landmark report in that it had the good luck to be published at a time of a major shift in university society relationships. In response to social unrest in the late 1960s and early 1970s, governments had reformed university governance systems to encourage universities to regard themselves as self-governing communities of students and scholars (Shils & Daalder, 1982).

From 1980 onwards, this process began unravelling with increasing emphasis on universities as places where societal benefits were generated through individuals realising their own ambitions (Delanty, 2002).

This was not necessarily something which universities were themselves deliberately driving except insofar as it was a means for universities to acquire more resources. In the US, the Bayh Dole Act of 1980 allowed universities to lodge patents based on federally-funded research, and this began a headlong rush in by US universities to create technology transfer offices to maximise their income potential (Mowery et al., 2001). In the uneven growth, debt crises and fiscal austerity of the early 1980s, ideas of entrepreneurship and income generation came to the fore as a potential survival mechanism for universities faced with sometimes swingeing cuts and certainly financial uncertainty (Powell & Dayson, 2011).

This opportunistic set of activities by which universities sought to generate income and secure their survival became transformed into something which appeared to be a distinct activity for the university as a whole. The idea of the third mission emerged in the 1980s out of a growing dissatisfaction with linear models of innovation that regarded universities as an 'upstream' input to innovation to be later taken forward by research organisations and firms (Laredo, 2007). Studies into the innovation process demonstrated that innovation was far more interactive and non-linear than this model supposed (Kline & Rosenberg, 1986). This fitted with an argument that universities should be involved throughout the knowledge creation and exploitation process. This suggested a 'third' mission for universities alongside blue-skies research and teaching. Some institutions embraced the opportunity to generate new funding sources (Clark, 1998). But interactive knowledge production, became seen as synonymous with the university 'third mission'.

But the reality is that the linear model was always far more a political project than an accurate description of how knowledge was produced (cf. Bush, 1945). In the post-war reconstruction effort, the linear model justified investing in universities to rebuild national economies (Etzkowitz, 2008). The reality was always that universities' various knowledge activities were always to some extent involved interaction with external partners. But by association with the third mission, knowledge exchange became saddled with a sense of being part of a contentious political project to change the nature of universities, and to give them an additional mission.

It is possible to be clear that knowledge exchange is not something exclusively associated with universities' commercial transactions. Neither is it something that has no salience for universities' other activities, because some degree of knowledge exchange can be found in almost all university activities. Finally, knowledge exchange is not exclusively a new process: it has not become valuable exclusively to deal with modern challenges.

The idea, salience and value of knowledge exchange lies at the heart of the idea of a university. Having eliminated those misapprehensions specifying far more clearly what knowledge exchange is becomes possible.

2.2 KNOWLEDGE EXCHANGE IS A STYLE OF HANDLING KNOWLEDGE CIRCULATION PROCESSES

Universities can be understood in many ways, including as employers, as real estate managers, as brands, as sources of volunteers, or talent attractors. But many kinds of institution fulfil those roles – the one activity which is unique to and defines the institution of university is the production of knowledge through set of overlapping processes which we refer to for the sake of simplicity as the knowledge circulation process (Allen, 1988).

- Universities create that knowledge, directly through research and indirectly through scholarship.
- Universities store that knowledge both in terms of their libraries, archives, museums, collections but also in the memories and skills of their faculty.
- Universities impart knowledge to students through the direct education process and the wider student experience.
- Universities circulate knowledge by publications, conferences, broadcasting, public relations, dealing with journalists.
- Universities apply their knowledge in different contexts through consultancy, advice, expert positions.
- Universities also remove redundant, outdated or false knowledge by maintaining academic communities collectively challenging knowledge and assumptions.

Although many kinds of institution and actor are involved in these processes, universities are central to them; this importance of knowledge processes can be used to define the 'idea' of a university. This gives universities many points of contact into society, where this knowledge is eventually used. A hierarchy of activities by which universities contribute their knowledge to society is represented graphically in Appendix 1.

What is obvious from the preceding description is that the locus of these knowledge processes is not exclusively within the boundaries of the university. There are a range of different actors involved in these knowledge processes, including students, firms, public sector organisations, arts audiences, cultural visitors, community groups, policy-making bodies, learned societies and governmental inquiries. Successfully creating knowledge depends at least in part upon managing relationships with these external bodies.

Students have to be attracted, recruited, registered, sorted into courses and classes before the pedagogic process can begin, then at the end of the process that learning has to be accredited to the satisfaction of outside partners. At this point, students become graduates and alumni and can transfer that knowledge into the society through their employment, activism, volunteering and leisure activities.

But the involvement of external actors in the knowledge process is not just as 'empty vessels' to be filled with the appropriate knowledge from universities. Universities are not the only actors with knowledge relevant to universities' missions. Most directly, firms, public research organisations and government research departments are involved in creating their own knowledge which may have salience for academic research. What Wynne (1989) calls 'lay communities' have their own knowledge which can be useful when combined with academic knowledge to create understandings of the world better both from the perspective of the scientist and of the lay community.

Interaction is not something new which has to be advocated to persuade universities to change their behaviour. Rather, interaction with societal stakeholders has been a persistent and enduring feature of universities; Feldman & Desrochers (2003) note how in the case of Johns Hopkins University in Baltimore, despite specific managerial edicts to prevent interacting with business in the 1930s, the university became the centre of an emerging medical technology cluster which has persisted to the present day. What has evolved in this period are conceptual models used to explain how universities interact with society. Rather than regard knowledge exchange as a normative concept or university mission for a university, it is better understood as the latest iteration in attempts to more formally conceptualise these manifold interactions.

Knowledge exchange evolved as a concept through attempts to understand university-society interactions. The first concept to emerge was "technology transfer", that universities could pass ideas and technologies that they had developed on to businesses who could then exploit them (CERI, 1982). The weakness in this idea was that it was clear that 'technology' was a very restrictive description of the essence of what passed from universities to external actors. From this came the idea of knowledge transfer, that it was knowledge in the round rather than just technology which passed to business.

But closer analysis revealed that there was not just a transfer of knowledge from universities to other actors, but that other actors also brought their own proprietary knowledge to these relationships (Nonaka & Toyana, 2003). The concept of 'knowledge exchange' emerged to better capture what is important about these relationships. By placing it in the lineage of ideas from technology transfer to knowledge exchange makes clear that knowledge exchange is not itself intrinsically valuable, but it is a way of understanding, and hence reacting to, external interactions in knowledge processes that are important to universities.

3. KNOWLEDGE EXCHANGE AND UNIVERSITY MODERNISATION

3.1 UNIVERSITY MODERNISATION AND THE MODERN PROJECT

Governments are becoming increasingly demanding of the universities that receive public funds. There has been in the last decade or so a growing recognition of the importance of knowledge to social and economic development, and governments have been looking to universities to support that development. At the level of the European Commission, there is increasing pressure on universities to support the development of a prosperous and sustainable European Union. At the same time, there has been a growing belief that the sector's traditional approach to self-governance has led to inefficiency and resistance to adapting to these new demands. The result has been a co-ordinated effort across Europe to reform university decision-making processes to ensure that universities are more closely aligned with the interests and needs of the societies that fund them (CHEPS et al., 2009).

One of the efforts of the Commission has been to fund the MODERN platform, in the framework of which this report has been produced. The aim of MODERN is to provide a series of knowledge resources for policy-makers, practitioners and university managers seeking to improve their institutional productivity and effectiveness. Universities have to manage themselves strategically to ensure that they are able to secure the necessary resources to guarantee their long-term viability. But the reality of modernisation is that it is neither straightforward nor simple, and a degree of nuance and depth is necessary from all concerned in order to produce the desired benefits.

New public management is a very effective tool for encouraging and optimising provision what Gunasekara (2006) calls 'generative' outputs, well-understood, tangible outputs with clearly defined users. In the domain of health care, for example, whilst the provision of routine operations (such as cataracts or varicose veins) can be managed in quasi markets between hospitals. Conversely, public health campaigns, involving slowly changing public behaviours, much less amenable to short-term measurement, and with a much less clear beneficiary group, tend to be undervalued in these management systems, even if long-term behavioural change is in the long-run the more socially efficient outcome.

NPM is less effective at stimulating those kinds of activities that are weakly defined or where there is no strong customer. Knowledge exchange is a quintessential example of such a vague activity, because it is embedded into so much of what universities are doing, and at the same time, there is a high level of abstraction in terms of the beneficiaries and benefits.

On one level, governments want universities to undertake activities with clear public net benefits, but at the same time, those net public benefits may come about through private benefits – for example through patenting or licensing activity, which are ultimately assumed to produce public benefits. There is a risk that a desire to produce clarity lead to (easily-measured) private benefits being assumed to equate to the public benefits.

The effect has been to focus on short-term goals for which the progress towards can easily be measured at the expense of longer-term activities or those lacking easily measurable indicators. This has reinforced an unwelcome tendency amongst governments – and universities – to focus on a very narrow version of knowledge exchange, based on commercialisation and technology transfer (Benneworth & Jongbloed, 2009). Technology transfer is relatively easy to manage as a discrete task, and organisations like the Association of University Technology Managers have developed a well-defined set of indicators for measuring activity (AUTM, 2009; see also PACEC & CBR, 2009).

But when one looks more closely at what is valuable about knowledge exchange, it is clear that it transcends commercial transactions and takes place through all the activities of universities. University modernisation is a process of focusing, choosing goals, prioritising and concentrating resources to achieve clear results. Real care is necessary to successfully achieve this when the overall goal is diffused across a range of activities. For this reason, the case of knowledge exchange is a specific example of a more general problem that universities face around modernisation where it can be very difficult to specify precisely what are the benefits of a university.

3.2 UNIVERSITY TENSIONS AROUND KNOWLEDGE EXCHANGE

Strategic management has become increasingly important for universities. Strategic management is a means to provide this improvement, by identifying what it is important to do well, and focus improvement on doing those things better. Efficiency comes by ensuring that there is competition between providers on grounds of cost, whilst innovation comes about by allowing experts with detailed knowledge of those services to improve provision under the stimulus of cost competition. This is now widely accepted in public services as a whole, although the idea for the so-called 'new public management' originated in higher education (Kickert 1995). Governments desire to increasing public services' efficiency and effectiveness at a time of increasing demands on the public purse (Ackoff, 1999). This makes new public management an inescapable reality for the contemporary higher education sector.

There is now a high degree of sophistication in understanding performance improvement in particular areas of higher education provision. But at the same time, there are weaknesses acknowledged in the approach. New public management depends on well-informed governments able to clearly state goals and purposes. Problems emerge where service providers have better knowledge than governments and regulators, and providers are unwilling to share that knowledge with regulators (the 'principle-agent' problem, Eisenhardt, 1989).

But the problem for knowledge exchange is not the 'principle-agent' problem, but rather that it is such an ubiquitous activity – by being present in so much of what universities do, it risks being taken for granted, and overlooked. Strategies are abstract and require that those developing them develop simplifications. Knowledge exchange takes place through human relationships, which are complex and context-dependent activities. This raises the challenge of co-ordinating human behaviour in a single institution across many activities with very different contexts.

Knowledge processes are fundamentally social processes: although some knowledge can be easily codified and transmitted over space, the most useful kinds of knowledge are produced interactively (Paavola et al., 2004). It is not just facts and figures which are important in solving real world problems, but knowing which facts and figures are relevant to a particular situation, interpreting them within a theoretical framework to better understand and improve the situation. Research has shown the extent to which this is a social process, and requires interaction between people, with co-operation built on trust between actors.

But at the same time, universities are under pressure to compete more vigorously with one another. Payment by results places institutions under pressure to be able to demonstrate that results 'belong' to them, which is not a good foundation for building trust. Management techniques developed to steer internal actors may be inappropriate for the steering of activities involving external parties. Universities run the risk that other partners seek to 'free-ride' on them and ensure that they benefit more from the relationship than do the universities. But these are risks that have to be dealt with if universities are to effectively participate in collaborative knowledge processes, in knowledge exchange, and make sure that knowledge exchange helps promote the university's strategic interest.

3.3 KNOWLEDGE EXCHANGE IN AN AGE OF NEW PUBLIC MANAGEMENT

Knowledge exchange is a process whereby university agents interact with external actors in their knowledge-based activities. These interactions might come at all stages of the process: working with research partners in creating new knowledge, placing students and graduates into firms to transmit knowledge from university to business, letting local businesses use their university library, hosting high-technology spin-outs in science parks or encouraging staff to volunteer in local voluntary and community sector activities. The exchange element of knowledge exchange comes in the interaction by university staff and students with actors that have other kinds of knowledge, that increase the scope of the knowledge that is produced.

Knowledge exchange by universities is an extremely elusive process and both universities and governments have difficulties in articulating precisely what that process involves. On the one hand, there are many examples of universities who are active in knowledge exchange, but on the other, it is hard to get beyond these *sui generis* examples towards a more general 'idea' of knowledge exchange and universities more generally. At the same time, the environment for knowledge exchange is also extremely complex and fluid; changes in the wider society and the nature of knowledge production are changing the processes by which universities interact with society. This further adds to the complexity of understanding knowledge exchange.

It is worth making a two-fold distinction in the complexity of the external environment. At the highest level, there have been a set of changes to society and the economy, that have changed the nature of knowledge production. These are, in the main, making knowledge exchange more important. The rise of 'open innovation' (Chesborough, 2003), for example, sees ideas and knowledge flow back and forward between different groups in the innovation process, driven by a dual need to create knowledge but also to appropriate knowledge from the value creation process. Universities need to be cognisant of the challenges of this new environment and to adapt themselves to be optimally positioned, and in particular, to ensure the sustainability of their knowledge generation capacity.

At the same time, there is a set of political drivers in terms of the nature of the ways politicians are placing demands upon, and regulating, higher education, which are changing the university-society relationship. Direct examples include the increasing importance of 'impact' as a criteria for funding research, or the introduction of employability and enterprise skills in the undergraduate curriculum. There have been indirect impacts through other changes made to higher education regulation, for example through changes to universities' legal status which allowed enterprise activity such as patenting, spin-off companies and science parks.

But it must also be acknowledged that there have been impacts on universities in terms of the public (political) rhetoric associated with knowledge exchange activities. The issue for universities is that these rhetorical messages are messy, vague, imprecise, sometimes contradictory and highly fluid. From a strategic management perspective, it is important to respond to signals provided by political rhetoric, but it is also important to interpret these signals correctly. Because the messages are rhetorical, and political, they are not always literally true: statements by politicians and bureaucrats do provide an indication in the future evolution of regulatory systems, but they require careful interpretation.

So universities find themselves in a very challenging environment: they are required to change what they do - and how they manage what they do - in relation to society at the same time as society is changing, the way they relate with government is changing, and governmental rhetoric about what universities should do is dynamic and volatile. Teasing apart these various elements, it becomes possible to identify several distinct elements for a strategic management agenda for knowledge exchange:

- The development of an institutional strategy which co-ordinates activity within the institution to best position itself for future change
- Developing institutional expertise in understanding the environment and as well as institutional capacity for knowledge exchange.
- Identifying a set of tangible outcomes to be delivered through the strategy which will configure the institution to be most successful into the future.
- Ensuring that the activity does not itself become pigeonholed as a third-stream activity besides teaching and research, but changes the way that these two core activities create social connectivity.

3.4 THE IMPORTANCE OF RESOLVING THE KNOWLEDGE EXCHANGE DILEMMA

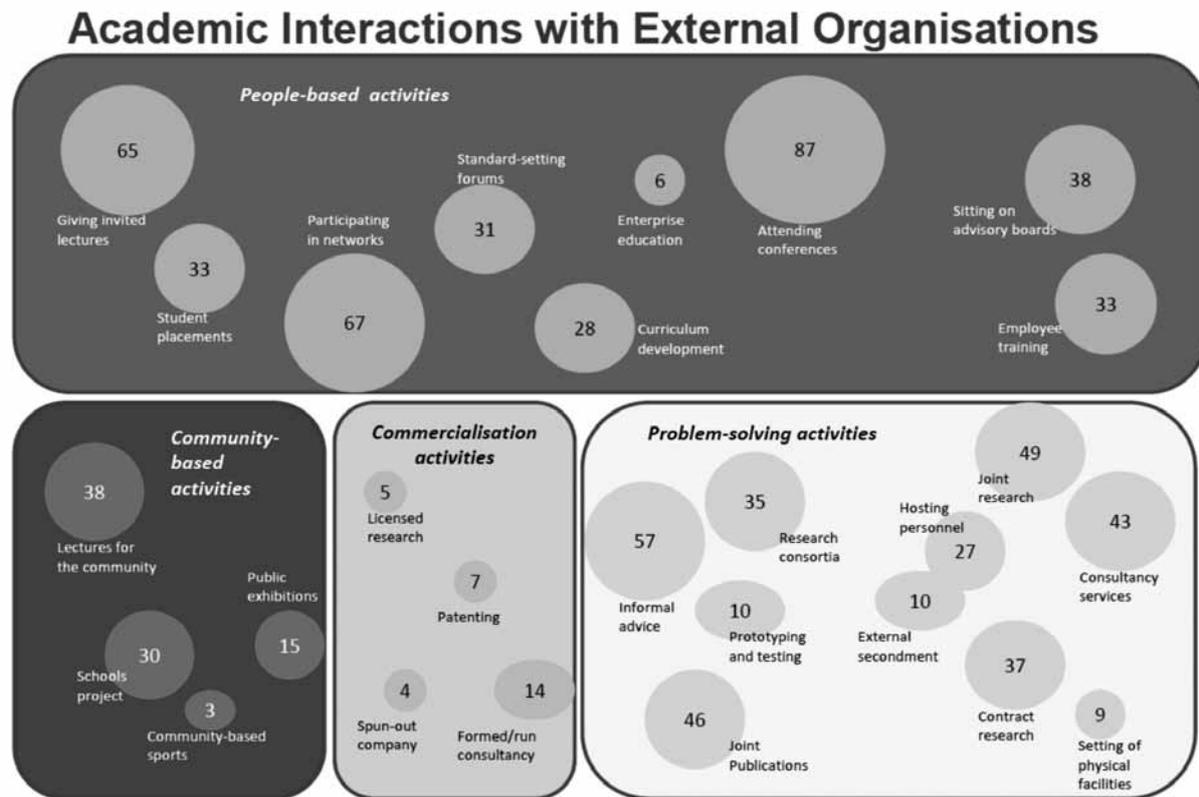
The reason that knowledge exchange makes a very interesting case in terms of modernisation is because it is something which universities have always been involved in. It is now commonplace to argue that knowledge exchange is increasingly important, and that universities should be able to manage that knowledge exchange better in order to increase their overall contribution. As we later argue, the changes in the nature of knowledge production are far more complex than simply demanding more partnership working between firms and universities. It is clear that much is said about knowledge exchange which attempts to create a sense of urgency for change: policy-makers feel universities are not contributing enough so changes in the world are presented as requiring a dramatic change from universities. But this has sometimes been regarded as a challenge or threat to universities, demanding a new kind of institutional mission, and that universities pay attention to new stakeholders' voices, potentially impinging on their academic and institutional freedom.

Abreu et al. (2010) make the argument that this situation is a result of an excessively narrow focus on knowledge exchange activities. In their report, they develop a more comprehensive framework for understanding knowledge exchange, based on four kinds of activities in which academics interact with external organisations, which they describe as people-based, community-based, commercialisation and problem-solving. The figure below shows how from the basis of their survey of all UK academics, they find that the vast majority, if not all, academics are involved in knowledge exchange with external organisations.

It is the focus on commercialisation activities - licensed research, patenting, spin-outs and running consultancy businesses - that produces the impression that only a minority of academics are engaged with external organisations. Indeed, this figure makes forcefully the point that knowledge exchange is absolutely central at the heart of all academics' activities.

To this we would add the point that it is not just central to what academics are doing, but other parts of the university, including their management and service elements, not least because of the need to manage and provide services for staff who are fundamentally externally oriented.

Figure 1: Academic interactions with external organisations UK, full population survey



Source: Abreu et al. (2010).

In making sense of this perception of knowledge exchange as a threat to universities, there are two important points which help to clarify the situation. The first is that knowledge exchange has not always been something which has been to the fore of universities when they have drafted their strategies and visions, because of the pressure to focus on core tasks which are rewarded with funding. Given these huge pressures to demonstrate individual performance, there is less reason for universities to emphasise their collaborative activities. But the second point is that besides this strategic vacuum around knowledge exchange, there is a huge amount of activity going on centred around universities. Appendix 1 demonstrates the pathways by which university knowledge flows into society (Allen, 1989), and these pathways provide a means for knowledge to flow back into the university.

We argue that given that the breadth of activity within which the university is involved in knowledge exchange poses a challenge in terms of generating a strategic knowledge exchange agenda. If universities are to make the most of knowledge exchange, then that activity must be aligned with institutional strategic priorities. But at the same time, there is a need for universities' strategic priorities to better reflect a reality of the importance of the university's many contact points with the outside world. Universities are at the centre of networks of knowledge production, and the contacts that they have in these networks are potential partners that can help them to achieve other strategic aims. We therefore argue that the "knowledge exchange challenge" for universities can be conceptualised as developing a strategic agenda which strengthens knowledge exchange within existing university activities.

Knowledge exchange is something which offers universities opportunities as well as threats, and if effectively managed can help to strengthen the university, supporting teaching, research and societal engagement/accountability. The key question raised here is how can knowledge exchange be effectively managed for universities' own benefits, not least because different kinds of universities have very different knowledge exchange needs depending on their own institutional profiles and cultures. The approach we take in this report is that because knowledge exchange is so integral to what universities do, a first useful step on this journey can be taken by institutions better understanding what knowledge exchange is, how they use it, and then reflecting on the strategic opportunities it offers for universities.

The practice of how this will be achieved varies between institutions. In an age where different universities are adopting different profiles, these different profiles determine the kinds of activities they undertake. For large, teaching intensive urban universities with 'higher vocational' courses such as medicine, planning, accountancy and law, students and their placements will provide an important set of connections for the university. Conversely, more humanities-based, research intensive institutions may have their knowledge exchange connections within learned societies and broader epistemic communities. Nevertheless, even these very different kinds of institution can improve their strategic management by seeking to capitalise on the potential benefits which these relationships offer, and ensure that the institutional strategic management 'grain' fits with staff and student practices 'on the ground'. The key issue here is understanding the evolving context as it applies to those institutions.

4. KNOWLEDGE EXCHANGE IN A KNOWLEDGE SOCIETY CONTEXT

The emergence in the last thirty years of societies where education and knowledge capital are increasingly central to economic growth and social wellbeing have certainly had significant consequences for the institution of university. At the same time that the external environment within which universities are operating has undergone significant changes, universities themselves have undergone a profound shift in the nature of their internal organisation. The strategic management challenge for universities is to effectively reconcile the two, to ensure that their internal structures are optimised for external environment, and this is no different in the case of knowledge exchange. What is different is that knowledge exchange is both everywhere and invisible in the university, and therefore developing a strategic agenda for managing that activity is potentially very difficult. To place this in context, it is necessary to consider both these internal and external changes.

4.1 EXTERNAL PRESSURES: THE RISE OF MODE TWO AND THE TRIPLE HELIX?

It seems easy to make the statement that there have been tremendous upheavals globally in the last three decades, but to understand the strategic challenge for universities it is necessary to understand these changes. Technological development and globalisation have created new opportunities for interaction and knowledge exchange at a distance, and universities have adapted to these changes. Systems of government have evolved, with governments increasingly withdrawing themselves from the provision of services and contracting with providers to ensure the most efficient provision of societal services. At the same time, governments are becoming increasingly aware of a new class of intractable problems, including demographic ageing, climate change and resource scarcity, and are looking to their knowledge producers to contribute to solving these problems. These various pressures have come together to create a sense that the traditional way universities creating societal knowledge have changed, and that universities should conform to their roles in these new models.

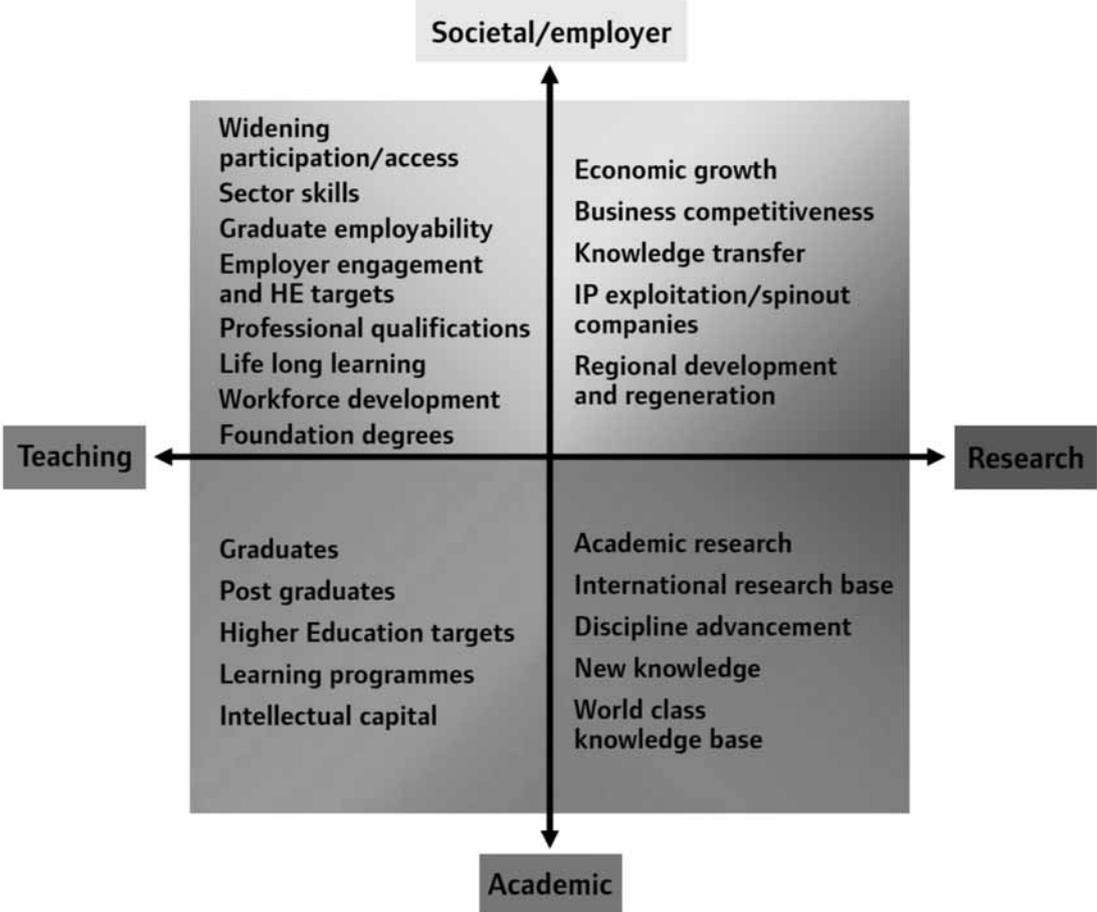
The first set of changes are in reality a diverse set of changes which are often referred to through the use of the shorthand of 'globalisation'. Whilst they have not only affected the university sector, they have had particular and specific implications for higher education. One element of that is the huge internationalisation of the sector, with increasingly levels of mobility of staff and students and the emergence of the world-class university as one positioned to tap into these global talent pools (Salmi, 2009). A second element is the realisation of an international knowledge commons: electronic publishing has made possible the reality of rapid dissemination and transmission of knowledge across global boundaries.

Thirdly has been the emergence of new universities and university systems in emerging economies that begun by mimicking the norms of European and American universities but are starting to exert a growing influence in the hierarchies and structures of the global sector.

The second set of pressures have been an evolution in governmental practice, already previously alluded to, with governments seeking to stimulate efficiency and innovation through market disciplines. The impact for universities has been a shift in models of governance and funding, which previous MODERN reports have described at length (cf. De Boer & File, 2009; Jongbloed, 2009). Universities have been given greater institutional autonomy, in return for a change in funding models, from block funding to contract-based/ output-based funding (payment by results). Universities have responded by developing strategic capacities, setting out their vision for collectively (as institutions) meeting these new demands they face. At the same time, in order to ensure that universities achieve those external targets, there has been a greater trend towards a centralisation of university management practices, steering individuals and units to ensure that they deliver outputs in line with this broader strategic imperative.

The third set of changes has been the rise of a new class of long-term societal problems slowly creeping up on industrial societies but which urgently need remedying. Solving these so-called Grand Societal Challenges – which include urban sustainability, demographic ageing, climate change and resource scarcity- is vital for the long-term viability of human society. These problems require concerted action for long-term across many fronts simultaneously in areas which often have a high associated short-term unpopularity or cost. There is an expectation on universities that they will make a special contribution to solving these problems. Even if that expectation is slightly unfair, it has not been aroused independently of the university sector. There is now a broad expectation amongst governments that contributing knowledge for the benefit of society is a core university goal, justifying their public support.

Figure 2: Multiple parallel pressures & expectations placed on university



Source: Wedgewood (2006)

It has been common in recent years to make the argument that there has been a sea-change in the way that knowledge is used as a consequence of these various parallel shifts. Gibbons et al. (1994) coined the phrase ‘Mode 2’ science to describe these changes. Mode 1 science was an approach in which scientists developed their theories and understandings separately from users, with scientists operating in disciplinary communities with their own internal logic. By contrast, Mode 2 was knowledge production in ways that followed a logic of use, oriented towards the solution of externally-specified problems. It has become common to claim that this necessitated a qualitative shift in the way that universities were organised and engaged with the outside world in order to be fit for the practice of Mode 2 knowledge generation. But Abreu et al. make the point (2010) that a majority of academics make their knowledge available externally, so it is disingenuous not to describe this as an academic norm. What has changed, arguably, is the wider environment and the way that knowledge production takes place, through open and democratic innovation (e.g. Chesbrough, 2003; Von Hippel, 2007), with far more participants with its value determined in these open, democratic networks and markets.

But as the authors subsequently argued, part of the reason for the popularity of the idea of a shift from Mode 1 to Mode 2 was that it was greatly attractive for politicians because of a strongly normative foundation in the idea of ‘useful knowledge’ (Novotny et al., 2003). It was also highly attractive for particular kinds of academics, those engaged in multi disciplinary research, applied research, consultancy activities or even new disciplines which were hitherto having difficulties in establishing themselves. The Mode 2 model has subsequently been criticised from many directions, with Etzkowitz (2008) arguing to more explicitly look at government policy intervention in university-society relationships, terming this a ‘triple helix’ set of relationships.

Science was never organised along purely Mode 1 lines: rather the idea was evoked in the post-war period to justify huge public investments in science to support particular fields of interest for government, such as energy security, new forms of transport, defence technologies and agricultural improvement. But the reality is that universities have always been engaged to some degree with external users, and actively engaged in knowledge exchange: it may be that universities should be paying more attention to actively managing their knowledge base and stimulating more knowledge exchange. What cannot be justified are claims that begin from the point that universities are ivory towers which have little external interactions, making substantial reforms necessary in order to realise the potential within universities.

4.2 INTERNAL PRESSURES: STRATEGIC MANAGEMENT OF DIVERSE ACTORS

In the introduction, we noted that recent decades of higher education policy have been characterised by attempts to promote a strategic approach to universities, to increase efficiency and innovativeness in the sector. Although this has progressed at different paces in different national systems (cf. De Boer & File, 2009; CHEPS et al., 2009), there are common directions of travel. Alongside this, there is active homogenisation across national systems as good practices are identified and diffused by national governments seeking to ensure that their national systems retain their international competitiveness. One of these common features has been the adoption of new public management techniques in higher education, and in particular the emergence of a strategic approach to university management (Kickert et al., 1997).

New public management in higher education arose out of a desire to clarify universities’ missions and tasks. The post-war period was marked by an increasing ‘publicisation’ of higher education in which governments assumed increasing responsibility for collectively funding universities (Deitrick & Sorka, 2005). The problem for universities was that with increasing funding came increasing demands, and universities found themselves having to respond to many demands from government at once (Maassen, 1996). These demands were not always coherent from within government, nor did they always have a solid understanding of universities’ capacities (Koppenjan & Klijn, 2004).

In trying to satisfy government demands, universities were unable to be responsive to other stakeholders, which led to a growing perception that universities were out of touch with their wider host society (Jongbloed et al., 2007).

Attempting to resolve that complexity was the rationale for introducing new public management. Rather than directly specify tasks for universities, governments are now moving to articulating the outputs desired from the system, and leaving it to universities to best achieve those. Those reforms have included both ‘carrots’ and ‘sticks’ to help encourage behaviour changes of both governance reform and changed funding. Universities have been given the autonomy to manage themselves free from direct government interference, whilst universities are threatened with reduced funding if they fail to deliver the outputs which are specified for them. The intention, and indeed the impact, has been to focus universities on using their new autonomies to identify how they will produce the necessary outputs to secure sufficient resources for their survival.

This has stimulated university managers to think about their institutions as coherent entities, ensuring their various elements work together effectively to secure institutional survival. This has placed a premium on developing a common understanding of what the university is, what are its purposes, and how they will be achieved in a competitive resource environment. This has led to the rise of strategic management in universities, adopting business practices where a mission, vision and aims are developed for the institution as a whole, and resources allocated internally to ensure that the strategy is successfully delivered. Targets and performance indicators are set, progress towards targets are monitored, and plans revised and revisited in the light of changing performance or external conditions.

The advantage of the approach is its simplicity, in freeing universities from burdens of central management and allowing them to determine their own strategies for survival and success, thought to maximise the chance for efficiency and innovation. But at the same time, this has been in some cases a weakness, because it has encouraged what might be thought of as an oversimplification. To deal with competing demands between internal actors, universities have been forced to simplify their outputs, to be able to gauge progress towards common targets, and how different elements of the university are contributing to that mission. This has been reinforced by a tendency to pursue missions and goals which are directly rewarded by funders, but which in combination can produce perverse and undesirable outcomes.

It is important to stress the risk in knowledge exchange of imperfect signalling, and in particular, in misunderstanding funders' intentions. Because knowledge exchange is diffused across all HEI activities, it is highly volatile and vulnerable to policy interventions. Under such circumstances, reacting in a short-term way to policy instruments and policy-makers' statements can lead to a failure to properly appreciate and react to more substantial long-term and environmental changes.

This then raises the question of how can universities generate knowledge about their own performance given the complex nature of knowledge exchange.

4.3 KNOWLEDGE EXCHANGE AND UNIVERSITY STRATEGIC MANAGEMENT

Strategic management is fundamentally a performance improvement process. The basis for performance improvement is rational decision-taking – by understanding the operational environment and institutional capacity, it is possible to improve performance and improve institutional positioning. Strategic management was developed in the context of firms seeking to secure their competitive position, but with the introduction of markets and competition to higher education, strategic management is increasingly relevant for universities. Modern strategic management analysis stresses the importance of institutional learning (Senge, 1990; Garvin, 1993) and institutional capacity to gather evidence and sensibly analyse it to improve performance.

In applying strategic management to universities, and particularly in the field of knowledge exchange, there are three implications which come to the fore. The first is that knowledge exchange in universities takes place through many different kinds of activities at once. In each of those different activities, knowledge exchange plays a very different role. A key requirement of effective strategic management is in being able to co-ordinate between these different activities. Powell & Dayson (2011) highlight the role of the university culture in stimulating an environment where the whole university community is encouraged to develop external linkages, but achieving that means making many small changes to many systems, policies and decisions. Simply declaring a university to be engaged or active in engagement is not enough here, and progress can only be measured in terms of the building of novel relationships.

Knowledge exchange falls clearly within the category of activities that are very difficult to measure, because of many problems with the kinds of indicators that might be used. The first is that knowledge exchange takes many forms, from articles in the press to visits to museums, co-publication, joint projects with companies, student projects, consultancy activities. CERI in 1982 identified five main ways in which university activities interact with society, and this highlights the breadth of activities and the kinds of mechanisms which underlie them (cf. Table 1).

Table 1: Ways in which universities may exchange knowledge with outside partners

University means of giving knowledge	Mechanism for delivering service
Equipment that outside party uses in own learning/ research activity	Use of equipment, premises, laboratories, laboratories Use of teachers and students to make direct contribution Drawing on the stakeholder in delivering occupational training
Sale of 'transmission of knowledge' as service, e.g. training or education	Offering training as occupational, continuing education or cultural University receives a payment from stakeholder for delivery of a service A near private contract between the stakeholder and the university
Provision of report, advice, guidance to user	The university comes into the stakeholder as an outside expert The university provides services for the stakeholder with some reference to an 'order' by the stakeholder
Helping external party to solve a particular problem	University engages at stakeholder request in developing solutions University has the autonomy and freedom to suggest a range of solutions away from overarching pressure.
Solving a particular problem on behalf of the actor	The university delivers a service for the stakeholder which is compatible with its institutional status

Source: derived from CERI, 1982

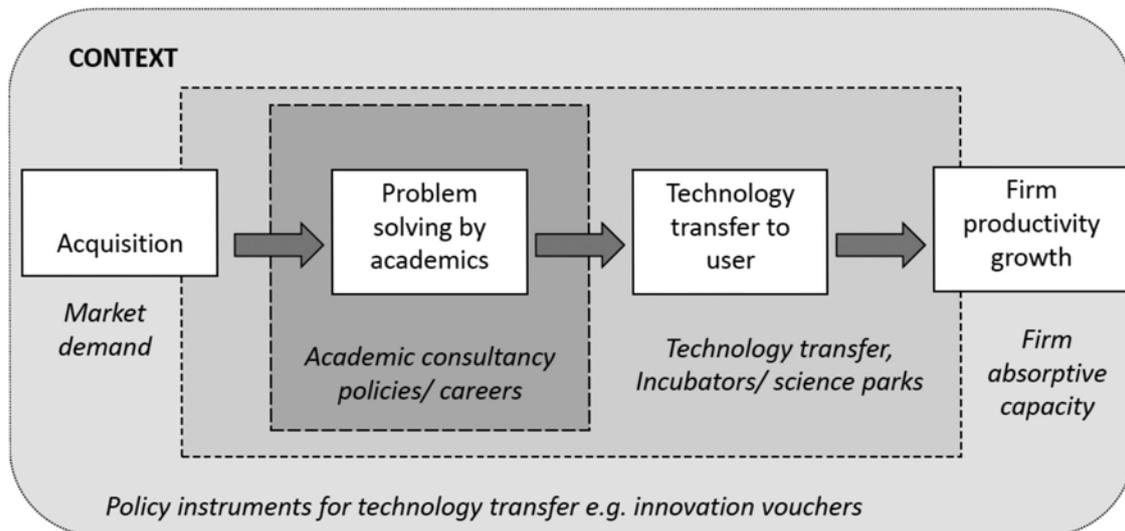
This is such a broad spectrum of activities that makes their strategic management extremely tricky. The other issue is that knowledge exchange takes place within activities which are strategically managed in distinctive ways; so knowledge exchange takes place through education, research, estates management, internal governance and consultancy activities.

From this comes the second implication, which is that universities have different degrees of control over these different processes. Universities are largely in control of their direct teaching activities, and can guarantee as far as reasonable that a student that graduates from a course will have acquired a particular body of knowledge to a level broadly comparable with other institutions offering similar qualifications. However, it is much harder for universities to guarantee their knowledge transfer activities in a similar kind of way, because much of that is dependent on the absorption capacity and inclinations of external actors. The figure below shows the 'spheres of influence' that universities have over one knowledge exchange process, enterprise engagement.

Whilst universities are able to guarantee a particular quality of activity by their academics, they have much less control over the demand for that knowledge, and in particular, the policy incentives and subsidies that may stimulate firms to work with universities (Benneworth, 2010).

Figure 3: Different degrees of university control over elements of enterprise engagement

Variable university influence and control over stages



Source: Benneworth (2010)

This contributes to the problem of an absence of good variables for the strategic measurement of knowledge exchange, because of this diversity. Jongbloed & Benneworth (2011) survey six attempts by policy-makers to develop effective performance indicators for external interaction and engagement by universities. The recurrent issue was that these indicators found themselves having to make an uncomfortable trade-off. Whilst it was possible to develop detailed measures for particular activities (for example numbers of articles in the press written by university staff), those detailed measures were too general to be of use in a management sense. Measures which were sufficiently comparable, such as staff time or event attendance, were too precise to be of use for different kinds of activities. Concrete variables, such as such as co-patenting activity, were too remote from the real activities that universities were undertaking to represent a sensible indicators (Crossick, 2006;2009).

The third implication is that the starting point for a knowledge exchange process has to be the value of those engagements to the university itself. Knowledge exchange has value to academics and students in improving the quality of particular learning and research processes.

But what these relationships are not themselves strategically important to the university. Indeed, part of the problem is that it can be very difficult for a university to specify *ex ante* which relationships are strategically valuable for the university, and promote those desirable kinds of relationship.

Therefore, it is necessary to take a more emergent perspective of engagement and knowledge exchange by universities. Effective knowledge exchange takes place through activities which deliver benefits both for universities, and for these outside stakeholders. Effectiveness can be understood in terms of activities which serves these joint interests. Understanding effective knowledge exchange requires understanding these interests, and how they come together in particular concrete activities.

The remainder of the report focuses on these issues, to understand the reality of knowledge exchange for universities in complex and diverse environments:

- Chapter 5 looks at the interests of universities in knowledge exchange, mindful of the fact that as we have already explained it is more a mode of behaviour for existing activities than a discrete (and often peripheral) mission.
- Chapter 6 considers outside stakeholders' interests in knowledge exchange: ensuring these outside partners' interests are delivered is critical to meeting the interests of the universities, securing their participating, creating benefits and acclaim for universities. We explore this by drawing on stakeholder theory which looks at how outside agents can work with universities towards common goals.
- Chapter 7 reflects on how these interests can be met through interactive shared activities; the more complex the activities, and the greater numbers of involved, the stronger the level of strategic coupling required for the knowledge exchange activity to be successful.
- Chapter 8 concludes by looking at knowledge exchange as an issue of strategically coupling core stakeholders to the universities to ensure long-term institutional viability.

5. THREE RATIONALES FOR UNIVERSITY KNOWLEDGE EXCHANGE

Because knowledge exchange occurs throughout universities' activities, universities' own interests in knowledge exchange play an important role in shaping knowledge exchange processes. In managing these diverse activities, universities need to find a 'common thread' as a set of principles for taking decisions in very different spheres of university management. Universities therefore need to determine for themselves why knowledge exchange matters for them: why is it important for them to interact with outside partners in the generation of knowledge. Answering this question helps to provide a robust set of principles which can be applied across the institution, ensuring that all activities work towards delivering the **ends**, with knowledge exchange (interaction with external partners) as a **means** of that delivery.

To create a conceptual framework for understanding this situation, it is possible to distinguish these different kinds of value for universities in the production, circulation, dissemination, gathering and storage of knowledge.

- **Intrinsic value**, which is to say that knowledge exchange improves the quality of those knowledge creation processes.
- **Extrinsic value**, namely that the knowledge exchange activity helps universities as institutions to access resources that would not otherwise be accessible and which helps with the longer-term institutional sustainability.
- **Narrative value**, which allows universities to demonstrate that they are doing particular things that other stakeholders value, particularly in the context of increasing demands for impact by users.

5.1 THE INTRINSIC RATIONALE FOR KNOWLEDGE EXCHANGE BY UNIVERSITIES

The intrinsic value of knowledge exchange for universities is that it improves the quality of the knowledge creation and circulation processes. A distinction can be made in the way knowledge circulates between codified and tacit knowledge. Codified knowledge (know-what and know-why) is knowledge – such as facts and theories – which can circulate in artefacts such as text books and journals, and whose transmission is mediated through those artefacts. Much academic knowledge is codified into artefacts because of the way in which it is reported. But what is reported as codified knowledge can also be dependent on tacit knowledge for its production. Knowledge exchange is a regular part of knowledge processes in science precisely because it facilitates progress towards desirable research end goals.

Tacit knowledge (know-how and know-who) is knowledge of how to make inductive choices in complex problem situations, knowing which strategy or partner can best help in solving a particular problem.

Tacit knowledge is experiential and socialised –inductive knowledge can be transmitted and created through socialised learning experiences where partners work together to solve problems, each contributing their own inductive insights to solve a problem (Malecki, 1997). The solution to that problem then represents new knowledge, new knowledge which could not be created without the involvement of the various partners, or at least not without considerable individual effort. Knowledge exchange makes that knowledge creation process easier (or indeed possible), saving time and reducing costs.

Knowledge exchange – saving time, increasing speed and raising quality – is extremely useful in universities where all of those three characteristics are at a premium. The solution of a scientific problem may only be possible by involving non-academic inductive insight (or inductive insights which the academic does not have) which contribute to deductive insights which can be transmitted as codified knowledge. An example might be that an academic wishes to test a new experimental technique reported in a journal, and contribute to the demonstration or otherwise of its replicability, something highly important for scientific advancement. But as Latour & Woolgar noted, tacit knowledge is vital to the way experiments are set up in laboratories, and even a report of a new technique will not transmit the knowledge of how to ‘do’ experiments. That knowledge builds up in laboratory teams in the course of their career experiences and which they develop through study visits, visiting fellowships, hiring technicians from industry and many other ways to bring different inductive knowledge into the group.

Knowledge exchange’s intrinsic value does not relate exclusively to research, but it can relate to any knowledge process undertaken by a university. A good example can be taken in the field of teaching from the University of Aalborg in Denmark, which has achieved a degree of renown on account of its Problem-Based Learning curriculum model (Kolmos et al., 2004). All learning is undertaken in group-based team work towards using theoretical learning to develop solutions to problems. Knowledge exchange – within the group, with academic supervisors, and with ‘problem owners’ – is thus absolutely vital to the educational experience. The Aalborg model has been widely cited (e.g. OECD 2007) as a good example of innovative pedagogic practice which develops in students an appreciation of the important of inductive judgement in the application of knowledge to develop solutions.

5.2 THE EXTRINSIC RATIONALE FOR KNOWLEDGE EXCHANGE BY UNIVERSITIES

Knowledge exchange’s intrinsic value is in providing access to resources which facilitate knowledge production and circulation – accelerating research efforts, raising the quality of knowledge produced, generating interesting questions. By contrast, the extrinsic rationale is that knowledge exchange produces a wider set of benefits for a university that are not directly related to the production of that knowledge through exchange. What knowledge exchange provides universities with is a set of contacts and linkages, and those linkages prove useful in other contexts.

Effective management of knowledge exchange needs therefore to be aware of the possibilities of exploiting those contacts without unduly damaging them through opportunism or instrumentalism.

There are a variety of means by which these links can help to promote universities’ wider interests and activities without relating directly to the knowledge circulation process. Links with outside partners in the research process has increasingly become a signal of the value of that research. In Switzerland, the Federal Institutions of Technology agreed a Performance Mandate for its funding with the Swiss Federal State, including measures of working with industry and generation of private income. In Germany, in the Exzellenzinitiative a number of universities which had strong links to industry were able to use this to bolster the case for their excellence (Karlsruhe Institute of Technology, RWTH Aachen and Munich University of Technology). Their external linkages therefore helped these universities to acquire additional core research funding justified by the value it would produce downstream.

A second value in the connections comes through the fact that universities often need to create placements for their staff and students. Many student courses involve one or more corporate placement as part of the graduation requirement, and finding sufficient placements for all students can be considerably taxing. Likewise, staff in university systems may be entitled to sabbaticals where they extend their domain knowledge, and placements outside the university can help provide access to resources and networks of a scale unaffordable in the university sector. The challenge is in finding partners who are suitable for these placements and do not take great effort to manage. Having links with an existing base of companies, public and voluntary organisations therefore facilitates the process of finding partners to work with, which in turn acts as a foundation for later interaction and knowledge exchange through the successfully delivered placement.

A third value in the connections comes through the value of having vocal supporters for the value of what universities are doing. There is an increasing recognition of the fact that universities are important political actors and the outcomes from local political decision-making can be important for them. This can place universities in a difficult position because in these political processes they have to act as self-interested actors. Universities can suffer by comparison to other actors – for example firms – who are able to clearly make the case that public policy support for them brings wider societal benefits. It is clearly of value to universities to be supported in these public policy discussions to have strong partners who are willing to press government to support universities: in the Netherlands, Philips has been supportive to government of the nearby Technical University of Eindhoven, and this has paid dividends in terms of government support to Eindhoven to acquire wider European research funding through for example the Knowledge and Innovation Communities (Dassen & Benneworth, 2011).

A final benefit to universities which can arise through knowledge exchange is in identifying trusted critical friends to work with the university at a senior level to improve governance. As Malcolm Gillies recently noted, involving external actors in university decision-making requires finding actors who share the values of the institution and are willing to take a long-term view of the wider university interest. In a case study of Newcastle University, Benneworth (2007) noted how knowledge exchange activities within the university had created a cadre of trusted business actors who shared the university's core values sufficiently to bring their expertise to bear on solving particular problems – for example around estates management financing – faced by the institution. Knowledge exchange provides a means to experiment with different relationships and understand which actors share institutional culture and values sufficiently to add value to university governance structures.

5.3 THE NARRATIVE RATIONALE FOR KNOWLEDGE EXCHANGE BY UNIVERSITIES

The final value of knowledge exchange by universities is in the process of social value creation that in turn justifies the public benefits and privileges enjoyed by universities. Part of this are universities collectively telling a story about the value of higher education and research, and sustaining public support for what is now an increasing proportion of public expenditure. This has both general and specific elements: universities can condition publics to support the value of their activities, as well as more directly helping to satisfy and convince government bodies that universities are valuable for their host societies. But at the same time, creating an image of the useful knowledge of a university can be helpful for the institution in achieving its core purposes.

There is, as this report has already noted, a noticeable and definite growing pressure on universities to be able to demonstrate their value to their societies and funders. However, at the same time there is a problem that that value is incredibly diffuse, and it is hard to produce direct measures of that value (although UUK, 2009 and Hermansson et al. 2011 manage an impressive approximation in the UK and Scotland respectively). It has therefore been common to construct narratives of how 'things of value' emerge from universities. The Momentum Report of the Association of Universities and Community Colleges in Canada (AUCC, 2008) takes an expressly narrative approach, using knowledge exchange with private businesses as demonstrative of the 'value' of university research.

Engineering lighter aircraft parts

Over the last 20 years, engineers at Concordia University's Centre for Composites (CONCOM) have collaborated with more than 50 companies, particularly on developing composite technologies for aerospace applications. A highly acclaimed project on bonded wing development, sponsored by the Quebec government funded Consortium for Research and Innovation in Aerospace in Quebec, Bell Helicopter Textron Canada Ltd. and Pratt & Whitney Canada Ltd., formed an integral part of a larger \$2.2 million project. The project brought in expertise from Concordia University, the École Polytechnique de Montréal, the National Research Council, the Defence Research Establishment at Val Cartier and Delastek. Delastek, a Quebec SME, specializing in the development and manufacture of composites and plastics parts for aeronautic and transport markets, has realized significant growth through the success of this partnership.

Source: AUCC (2008), p.67.

One particular manifestation of this issue is in helping to validate the university as a contributor to wider societal goals (Charles & Wray, 2008). This has led to the rise of what has been described as 'urban science', a belief within policy communities that involving universities in regeneration projects helps to improve the quality of those projects (Perry & May, 2010). The net result for universities is becoming involved in large regeneration projects which may bring with them substantial resource endowments simply for being involved in the projects, just as businesses have long benefited from subsidies through things like advance factory units because of a belief that businesses are good for economic development. The role for knowledge exchange is in making tangible to politicians and policy-makers the benefits that universities bring, through their spin-off companies, the patents and the employed graduates, whilst also demonstrating a tangible link between those activities and infrastructures and activities which directly relate to the university's core mission (Benneworth & Hospers, 2007).

A third way in which knowledge exchange can help improve the image of the university is in the student recruitment process. A university degree is an experience good, one whose value to the user is only known after it has been acquired, in the case of universities at an increasing personal cost. Students therefore look for signals of the potential value of different degrees whilst having very limited information on which to do. Knowledge exchange – and linkages with outside partners – allow universities to simply signal the enriched nature of their curriculum to potential students, and provide a sense that the degree will provide something which will ultimately be of use and of value to the student.

6. OPERATIONALISING KNOWLEDGE EXCHANGE: A STAKEHOLDER APPROACH

The other dimension of university knowledge exchange parties is the interests of outside parties in the knowledge exchange. One of the effects of the increasing interactive and democratic nature of knowledge production has been a much wider interest in universities' knowledge. Partly, this is an issue of scale: with almost a majority of the population attending university, most citizens have an interest in the contributions of universities. But it is not just students who see the value of universities; there are increasing numbers of firms, voluntary and community sector groups who see a value in university knowledge. For those seeking to acquire and exploit university knowledge, the tacit nature of knowledge necessitates engagement with universities.

To understand what opportunities this creates for knowledge exchange through these relationships, it is therefore firstly necessary to understand more comprehensively who these outside partners are for university knowledge exchange. To do that, we firstly consider all the communities with which universities are involved, which we do through the application of a stakeholder perspective. We then consider which of those groups might be interested in knowledge exchange with the universities, the mechanisms through which that might take place, and the stakeholder interest in that knowledge exchange. That provides a means in the following chapter to understand more comprehensively the kinds of activities by which universities build knowledge exchange relationships, and hence acquire a top-down perspective on the diffuse business of knowledge exchange.

6.1 WHO HAS AN INTEREST IN UNIVERSITY KNOWLEDGE EXCHANGE?

The idea of stakeholders emerged in the management literature as a means of understanding mutual dependency between organisations. Stakeholders of a particular institution are those who have an interest in the outcomes and performance of that institution (Ackoff, 1981; Freeman, 1984). Applied to university knowledge exchange, university stakeholders are those who wish to benefit from exploiting university knowledge which they acquire through a process of interaction. The effectiveness of the relationship (and in this case the effectiveness of the knowledge exchange) depends on the extent to which the mutual interests of the organisations coincide, and the relative balance of power between the actors (Mitchell et al., 1997). More powerful actors are able to use their influence to exploit relationships by shaping others' behaviour to their own benefit (Jongbloed & Goedegebuure, 2001). Stakeholders in university knowledge exchange have an interest in acquiring the knowledge, and a dependence through needing to work with the university to acquire that knowledge.

A stakeholder approach is based on the idea of resource exchange: to achieve their respective goals, organisations work together through relationships and shared activities. This interaction, relationship and dependence can be understood from a number of different perspectives. Andersen analyses policy formation processes in terms of the exchange of three kinds of resources, namely financial resources, knowledge and legitimacy (1990). Mitchell et al. (1997) take a slightly different perspective, that is on the degree of influence that one stakeholder has over another, in terms of direct power, legitimacy and the urgency of the claims made by the one on the other. What these approaches share in common is the interaction around shared interests producing mutual dependency linked through concrete activities.

The table below, taken from Burrows (1999) sets out a comprehensive list of universities' external stakeholders. This covers all those actors with an interest in the university at any level. Some stakeholders have a purely financial interest in the purchasing power of the university as an institution. Other stakeholders have an interest in using the facilities which the university has and may make open to the public. Public bodies have a range of interests in universities: city authorities may be dependent on universities for the effective planning and management of urban quarters, and the buoyancy which students may bring to the city as a whole. Families of university employees have an interest in the household income which the university provides.

Table 2: Stakeholder categories and constitutive groups

Stakeholder category	constitutive groups, communities, etc.
Governing entities	state & federal government; governing board; board of trustees, buffer organisations; sponsoring religious organisations
Administration	president (vice-chancellor); senior administrators
Employees	faculty; administrative staff; support staff
Clienteles	students; parents/spouses; tuition reimbursement providers; service partners; employers; field placement sites ...
Suppliers	secondary education providers; alumni; other colleges and universities; food purveyors; insurance companies; utilities; contracted services
Competitors	direct: private and public providers of post-secondary education potential: distance providers; new ventures substitutes: employer-sponsored training programmes
Donors	individuals (includes trustees, friends, parents, alumni, employees, industry, research councils, foundations,...)
Communities	neighbours; school systems; social services; chambers of commerce; special interest groups...
Government regulators	Ministry of Education; buffer organisations; state & federal financial aid agencies; research councils; federal research support; tax authorities; social security; Patent Office
Non-governmental regulators	foundations; institutional and programmatic accrediting bodies; professional associations; church sponsors
Financial intermediaries	banks; fund managers; analysts
Joint venture partners	alliances & consortia; corporate co-sponsors of research and educational services

Source: after Burrows, J. (1999) in Benneworth & Jongbloed (2009).

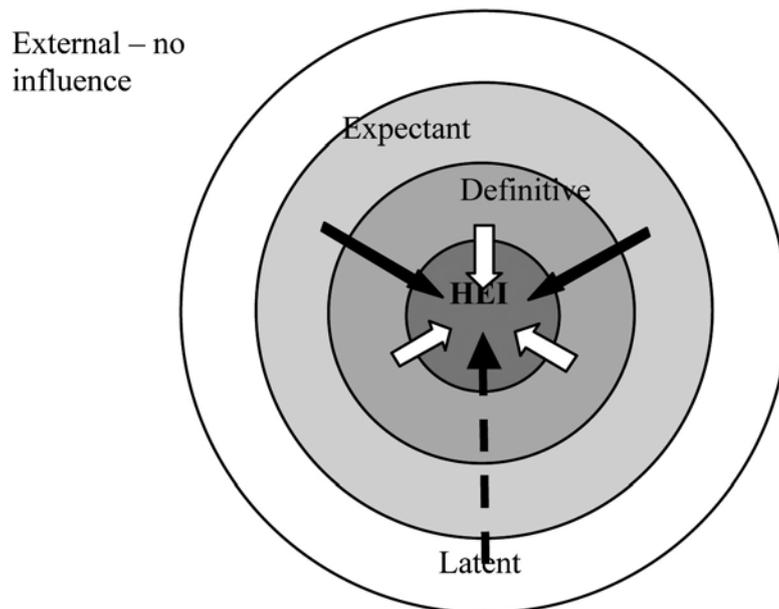
But there are clearly a (more limited) group of stakeholders who have an interest in working with the university to acquire knowledge. This group is arguably much larger than historically true because of the emergence of the knowledge society, and the increasing open and more democratic (or at least more marketised) nature of knowledge production. Nevertheless, there are just a sub-set of these stakeholders who have interests in interacting with universities around knowledge exchange.

6.2 WHY DO UNIVERSITIES RESPOND TO OUTSIDE PARTNERS?

A second dimension to understanding outside involvement in knowledge exchange comes through understanding university responsiveness to these outside partners. Involvement of external partners is not a cost-free activity, because of the displacement effects which partners may bring and the costs of managing their demands (Durant, 2008). In stakeholder theory, the answer is that stakeholders are important when they acquire a degree of salience to the institution under consideration. In the context of university knowledge exchange, salience is in allowing universities to achieve more than without the interaction with the stakeholder.

Stakeholder theory predicts that when actors take decisions about strategic priorities, then they have a tendency to rank stakeholders according to their salience (Jongbloed et al., 2008). This can be defined in terms of the number and strengths of the attributes (resources, legitimacy, urgency) that stakeholders have for the actor (Mitchell, 1997). The more of those resources that stakeholders possess, the more important they are to the institution under consideration. Mitchell et al. (1997) classify stakeholder salience into a number of bands depending on the number of attributes possessed, from definitive stakeholders (who have financial resources, and can make urgent, legitimate claims on the HEI) to non-stakeholders, possessing no attributes, with whom universities have no incentive to collaborate. This is shown in the figure below, from Benneworth & Jongbloed (2009).

Figure 4: The relationships between stakeholders and university decision-making processes categorised by stakeholder salience



Source: Benneworth & Jongbloed (2009)

This suggests there are three practical reasons for universities in engaging with external stakeholders, or at least why universities would choose to bear the costs of engagement in knowledge exchange. That is that by accessing the resources, the universities are able to achieve more in terms of their core missions than otherwise possible. Using Mitchell et al.'s classification (1997), the kinds of resources that universities might seek to secure through engagement with external partners can be classified thus:

- Funding: these are the financial resources which help universities to do things that would otherwise not be possible; this is unlikely to increasing the volume of activity of things already, but to providing the university with new strategic opportunities, infrastructure and assets which could not otherwise be internally funded.
- Legitimacy: universities have a general 'license to practice' in their activities based on being responsible institutions; but in some cases, that general license to practice does not hold, particularly where there are moral or ethical considerations, and knowledge exchange may engage partners who provide that ethical justification which allow interesting if contentious, activities to be pursued.
- Urgency: these are capacities which relate to shifting the political and cultural situation of particular activities; universities always have many opportunities of interesting things to fund with potential social benefits, but external partners may be able to establish the wider social interest of these activities by claiming (for example) that the universities provide the missing link towards creating an interesting activity.

6.3 WHAT KINDS OF ACTIVITIES MIGHT KNOWLEDGE EXCHANGE INVOLVE?

In order to understand the kinds of activities which might be involved in university knowledge exchange, it is necessary to understand the interests of these stakeholders in knowledge exchange. Drawing on our original model of knowledge creation as a combinative and creative process (cf. Nonaka & Toyama, 2003), these are actors with their own knowledge who seek to synthesise new knowledge drawing on university knowledge. University knowledge in this instance might be codified in terms of assets such as libraries or indeed through instruments, laboratories and other equipment (using Nonaka & Takeuchi's 1995 distinction).

Therefore, taking this broad definition, it is possible to consider a number of ways in which universities might make their knowledge available to external actors, providing access to equipment, bespoke training, consultancy, advice and solutions to actors problems. These in turn each correspond to a number of concrete mechanisms and activities by which knowledge exchange processes take place. The US Office of University Partnerships defined seven types of activity through which universities could engage with outside actors.

The full list is reproduced in Appendix 3, and the main mechanisms are listed below:

- Service Learning: students do social placements in return for credit
- Service Provision: longer-term targeted initiatives directed towards a specific group.
- Faculty involvement: academics working directly with business in knowledge transfer
- Student volunteering driven by students and unrelated to course credits
- Open learning, allowing community partners to undertake specific course
- Applied research identifying, diagnosing and solving particular partners problems
- Major institutional change reorienting the institution to better support a social group.

It is important in this analysis not to be too functional regarding the interests of the stakeholders. Universities have interests on a variety of levels, from deeply entrenched cultures, to high-level missions and visions, down to operational interests and daily demands (Smith & Webster, 1997). Similarly, external actors will have their own interests. Benneworth & Jongbloed (2009) for example problematize the idea of 'government' as a single coherent interest, contrasting the difference between Finance and Science/ Education ministries. Firms have different uses for knowledge, and demonstrate very different patterns of behaviours between knowledge relationships related to acquisition (social, unstructured, with redundancy, open) as against exploitation (transactional, managed, controlled, closed) (Yli-Renko, 2006). It is therefore necessary in knowledge exchange to understand the complexity of non-university interests in knowledge exchange relationships as it is the complexity of university relationships.

7. KNOWLEDGE EXCHANGE THROUGH MUTUAL BENEFIT

The third dimension of understanding knowledge exchange is in understanding why and how universities and external actors might work together. A simple answer is that there is a mutual benefit: there is an exchange of resources that allows each partner to achieve in the interaction better and more results than otherwise possible. Yet, at the same time it is important to acknowledge that relationships are not purely directional, and have other dimensions to them. In particular, the deeper relationships necessary for longer-term and fundamental knowledge exchange require a strategic coupling of partners to hold partnerships together through potential divergence of interests as activities progress.

7.1 KNOWLEDGE EXCHANGE AS MUTUAL DEPENDENCE BETWEEN UNIVERSITIES AND OTHER ACTORS

An issue of central importance in understanding how universities might work together is the issue of mutual dependence – knowledge exchange is not a unidirectional transfer, but rather an interaction dependent on relationships. Effective relationships build up where there are mutual dependencies, that is to say that both the universities and other actors are stakeholders in one another. Taking the three kinds of resource proposed by Mitchell et al. (1997), it is possible to see that particular kinds of dependence will lead to different forms of collaboration. This is usefully illustrated with reference to a pair of examples.

Firstly, consider the situation where a university research group has potentially discovered something with ground-breaking social, economic or environmental implications, but lacks the wherewithal to generalise and prove the concept. Working with a corporation can provide the university with access to the funds to prove the concept, and secure the basis for further funded research, but in return, the corporation secures privileged opportunity to develop tacit knowledge for the later exploitation of the idea. This can be regarded as a relationship of taking the next step, for the university opening up the paradigm, and access to future research resources, for the firm in building technology knowledge for next-generation innovations.

Conversely, consider a situation where a university is teaching doctors to work in deprived communities, whose residents typically have a different interaction with healthcare than people from more prosperous communities. This arises from a range of different causes, from lifestyle choices, working conditions, and approaches to dealing with healthcare professionals, and is understood through the discipline of medical sociology.

Universities can simply teach the appropriate medical sociology, but this risks teaching these future doctors that people in these communities need particular treatments for their own good which they do not necessarily understand.

This leads to arrogance which further contributes to the poor health outcomes of these communities. An alternative approach is to build access to these communities into these courses so trainee doctors learn about how to work with these communities, whilst the communities themselves are exposed to the sense that doctors are not unchallengeable experts. University resources are applied to improving the health prospects of the community whilst the community knowledge is incorporated into the curriculum.

It is possible to develop a classification of the modes of interdependence between stakeholders on the basis of the kinds of interdependencies which exist between universities and their stakeholders around knowledge exchange. An outline classification is provided in the table below, which is primarily illustrative rather than comprehensive. Of course, it is possible for actors to have multiple resource interdependencies: for the sake of simplicity, the table below illustrates only a situation where there is one mutual dependency between the stakeholders.

Table 3: Modes of interdependence between universities and external stakeholders in knowledge exchange activities

Partner University	Resources	Legitimacy	Urgency
Resources	Research laboratory: Co-investment in shared infrastructure for partnership working and commercialisation.	'Field research' station: based in fragile area together with actors with local knowledge.	Making a difference: Helping a locality come to terms with a (natural) disaster, supporting resilience and recovery.
Legitimacy	Corporate laboratory: Investment in semi-autonomous research institution or named laboratory that creates corporate goodwill.	Ethical research: Collaborative blue skies research projects with wider public ramifications (e.g. GM technology).	Lobbying: Working together to create a case to government for further research and action in the area.
Urgency	Taking the next step: A university discovery of potentially ground-breaking magnitude that needs further research work to prove the concept.	Acquiring consent: University research activity with contentious ethical ramifications supported/ legitimated by involved actors.	Public interest: Working together to address 'grand challenges' and urgent societal problems, generating momentum for public funding.

Source: authors' own design

7.2 ENDURING RELATIONSHIPS AND SHARED-SELF INTEREST

A second issue relating to the efficiency of the knowledge exchange relationships arises because they are not purely functional, that is to say they cannot simply be called into life when required and then mothballed once the knowledge exchange is complete (Lee, 2001). It is widely acknowledged that knowledge exchange relationships have a social dimension, and that this social dimension is vital to creating the commonalities necessary for the knowledge exchange. There are various different ways that people have sought to classify this social dimension of the collective basis necessary for knowledge exchange:

- Boschma (2005) argues that the key dimension is one of proximity, which may be purely geographical (as seen for example in clusters) but also may relate to being in the same company (organisational), having shared cultural values (institutional), common interests (strategic) or existing contacts (relational).
- The idea of Communities of Practice and Networks of Practice describes how relationships build up between people trying to solve common problems, developing shared cultures which then become the basis for other kinds of collective social behaviour not tied to the problem-solving activity (Wenger, 1998; Benner, 2003).
- Notions relating to professional identity have been used (e.g. epistemic communities, disciplinary tribes) have been used to describe how there can be co-ordination between separate individuals who nevertheless develop shared norms, behaviours and capacity for knowledge exchange based upon membership of common imagined communities (Haas, 1992; Becher, 1997).
- Social capital has been used as a variable, describing the tightness of internal and external connectivity within networks which facilitate constructive relationships and an ability to benefit from those connections (e.g. Putnam, 2000).

Not all knowledge exchange requires relationships – the more routine and codified the knowledge transaction then the less depth of relationships – and the less social capital, proximity, collective identity or social cohesion are required. It is possible to consider a spectrum from relatively simple transactions to complex and ongoing relationships.

- A straightforward piece of technology transfer, it might suffice that the university and business have experience of working with other sectors, speak a common language and have a shared technical disciplinary background.
- Research centres developing shared research programmes between businesses and academics will typically require a much more intense, ongoing and negotiated set of relationships, with multiple arenas where tensions can be discussed and addressed.

Relationships related to more complex forms of knowledge exchange often develop over time and there is a need to retain an alignment in the interests between participants as the relationship unfolds. The more complex those relationships, the greater the need for strategic coupling of those interests. A good illustration of the dynamics of strategic coupling in complex knowledge exchange projects can be seen in the recent rise of knowledge-based urban development, that is the development of new science facilities in urban areas to drive knowledge-based economic development (Perry & May, 2008). This might involve the development of a new science quarter or estate, and involve a wide constellation of stakeholders. As table 4 below shows, one issue for KBUD is the fact that these stakeholder interests are divergent, and particular projects have to be configured to hold together enough of these interests for them to have a chance of success.

Table 4: Different actors and their goals/ interests in strategic urban science

Actor	Goals/ interests
Regional government	Successful projects; legitimacy, electoral success
Universities	Research infrastructure, research income
Community groups	Regeneration, better local facilities
Residents	Improved employment in emerging sectors
Real estate firms	Profitable rental locations, development opportunities
High technology firms	Competitive locations with skill-base

Source: Benneworth et al., 2011.

Effective knowledge transfer operates when there is an alignment of partners’ interests held by partners, and they provide appropriate capacity for the kinds of knowledge exchange involved. Immediate, private interests are most amenable to simple transactions – consider a simple piece of consultancy where a research group wants income and the funder wants a problem solved. Conversely, longer-term, public interests are useful to holding bigger knowledge exchange projects together, and developments such as urban science, creating new urban-based innovation ecosystems, need effective embedding in longer-term relationships based on mutual trust and shared collective interests.

However, a further source of problem in analysing partner interests in urban science is that individual actors may themselves have different kinds of interests. These interests can be considered along two dimensions; there are long-term vs short-term dimensions, and there are public benefits as against private benefits. A university might have long-term interests in both developing new income streams (a private benefit) as well as demonstrating its wider social contributions (a public benefit); in the shorter-run, a university might have interest in maximising its third-stream income as well as wanting to create a positive image of itself in the mind of local residents. An illustration of the divergent interests of actors in strategic urban science is shown below, relating to a hypothetical new urban science development.

Table 5:. Different actors and their goals/ interests in strategic urban science

	Private Benefits	Public Benefits
Long-term, Strategic	University as resource-dependent organisation Local authority as employer, land owner, tax authority High-technology firms as responsible local citizen Local residents as users of pleasant urban space Real estate firms: profitable sustainable businesses	University as demonstrating fulfilment of societal compact Local authority demonstrating leadership function in partnership Public groups wanting long-term liveable cities Firms seeking stable, competitive locations
Immediate, Opportunistic	University seeking to maximise 'third stream' income to boost research Corporation as profitable (innovative) business entity Local residents as new business employees Real estate firms as owners of land packages	University as user of positive publicity Local authorities as owners of narratives of urban improvement Public groups wanting higher quality public space Firms wanting a strong local knowledge pool and untraded interdependencies

Source: Benneworth et al., 2011, forthcoming

A final issue arises where there is a divergence of the interests held by partners, for example when some partners have long-term, public interests whilst others have more immediate and opportunistic interests, as well as where interests are not suitable for the desired outcomes. Massey et al. (1992) highlight how where short-term interests dominate science parks, supposedly long-term projects, then there is no real knowledge exchange, and they default to simple real estate projects. Although this may meet the universities' interests, it has little to do with knowledge exchange and the benefits which this brings to universities. Therefore, the alignment of the kind of interests with the desired knowledge exchange appears to be an important determinant in understanding whether the activities proposed will lead to the desired knowledge exchange.

8. CONCLUSION: CLARITY IN KNOWLEDGE EXCHANGE PROCESS

Knowledge exchange involving universities is a very complex phenomenon. That complexity is derived from a number of distinct factors, which at the same time come together to create uncertainty and instability in knowledge exchange.

- Knowledge exchange is widespread across what universities do, but is not necessarily the most urgent concern for universities.
- The university sector has evolved in the last thirty years to become a central pillar of contemporary education policy, and as a result experiences growing pressure to increase societal contributions.
- There has been a change in the importance of knowledge in society and a shift in the way knowledge has produced which has influenced expectations upon universities.
- Much pressure on universities to be more engaged and undertake more knowledge exchange is coming from quarters which do not necessarily have a realistic understanding of university knowledge exchange.

To date, this complexity has tended to be addressed in one of two ways. Firstly, there has been a focus on research on individual transactions such as consultancy, spin-offs or student placements. But the rationale for such activity is at best a small part of the university interest, making it hard to understand why universities might exchange knowledge, and of what they ought be mindful in its pursuit. The second problem is that there has been a tendency – in part to circumvent the first point – to regard knowledge exchange as a separate task or mission for the university. The problem with this is that the justification for that is relatively weak – particularly when it is regarded as an unfunded obligation – and this often leads to this ‘third mission’ being peripheral within institutions.

Viewed from the perspective of university strategic management – where universities have to be clear about their missions, and prioritise their resources to achieve their missions and ensure their survival – knowledge exchange therefore often becomes invisible or overlooked. This is more an effect of the cumulative complexity of the many different ways in which universities engage externally and exchange knowledge than because it is not important for university mission. In better understanding the strategic importance of knowledge exchange to universities, there are a variety of starting points from which to structure its consideration.

- The different levels at which knowledge exchange is embedded within a university, from the high-level, abstract and general, to the micro-scale of the regular activities and challenges of the university community, and the different interests universities have in knowledge exchange, from the intrinsic, through the extrinsic, to the narrative.
- The different interests of the parties involved in particular knowledge exchange activities, and the relationship to the kinds of knowledge exchange activities, and the kinds of dependencies which the university can address through knowledge exchange, leveraging its own resources, legitimacy and knowledge to secure its institutional survival.
- The congruence of the interests of those involved in particular knowledge exchange activities, and the relevance of those activities for the type of knowledge exchange: the example was taken of urban science, involving long-term strategic interests, therefore requiring a strategic coupling of partners to high-level ideas as well as to the more immediate realisation of private profits.

It is clear that part of the problem in knowledge exchange arises from unrealistic expectations and understandings of what universities contribute to society. Universities existing contributions are often not acknowledged, which can lead to a disagreement between policy-makers urging universities to do more, with universities pointing to their manifold links into society and wider benefits. What is overlooked here is the scope that exists for the strategic management of this activity to improve its overall performance, getting beyond demands to create something completely new set against resisting institutional change.

It is evident that this is a political problem, arising from the way that a series of discussions have unfolded about the emergence of the knowledge society, and therefore a political solution is also necessary if there is to be a more realistic appraisal of improving universities' knowledge exchange performance. There is a need for a shift in rhetoric from all partners involved, to governments accepting universities already contribute greatly, universities acknowledging they can do more, and society at large articulating its value for those contributions. Once the current atmosphere has calmed, then there is a chance to look more rationally and synoptically at universities' societal involvement in terms of both their contribution to university core needs and those of societal partners, and help secure universities institutional future as independent institutions working with societal partners towards building inclusive, competitive and sustainable future knowledge economies.

9. BIBLIOGRAPHY

- Abreu, M., Grinevich, V., Hughes, A & Kitson, M. (2010) Knowledge exchange between academics and the business, public and third sectors, UK Innovation Research Centre Working Paper, Cambridge (UK): UKIRC.
<http://www.cbr.cam.ac.uk/pdf/AcademicSurveyReport.pdf>
- Ackoff, J. (1999) Ackoff's best: his classic writings on management, New York, John Wiley & Sons.
- AUCC (2008) Momentum: The 2008 report on university research and knowledge transfer, Ottawa: Association of Universities and Colleges of Canada. http://www.aucc.ca/_pdf/english/publications/momentum-2008-low-res.pdf
- Ackoff, R. L. (1981) Creating the corporate future, Chichester: John Wiley & Sons.
- Andersen, J. J. (1992) The territorial imperative: pluralism, corporatism and economic crisis, Cambridge, UK: Cambridge University Press.
- AUTM (2009) FY 2007: AUTM US Licensing survey: A Survey of Technology Licensing (and Related) Performance for U.S. Academic and Non profit Institutions and Technology Investment Firms, Northbrook, IL: Association of University Technology Transfer Managers.
- Benner, C. (2003), Learning Communities in a Learning Region: The Soft Infrastructure of Cross Firm Learning Networks in Silicon Valley, Environment & Planning A, 35(10), pp. 1809-1830.
- Benneworth, P. S. (2007) Seven samurai opening the ivory tower? University commercialisation communities of practise promoting economic development in less successful regions, European Planning Studies 15 (4) pp. 487-511.
- Benneworth, P. (2010) A Handbook of university benchmarking, Brussels: the European Centre for the Strategic Management of Universities.
- Benneworth, P. S. & Hospers, G. J. (2007) Urban competitiveness in the knowledge economy: universities as new planning amateurs, Progress in Planning 23 (1) pp. 3-102.
- Benneworth, P., Hospers, G. J., Jongbloed, B., Leiyte, L., & Zomer, A. (2011) The 'science city' as a system coupler in fragmented strategic urban environments? Built Environment (forthcoming).
- Benneworth, P. & Jongbloed, B.W.A (2009) Who matters to universities? A stakeholder perspective on humanities, arts and social sciences valorization, Higher Education DOI 10.1007/s10734-009-9265-2.
- Boer, H. de & File, J. (2009) Higher Education Governance Reforms across Europe, MODERN Executive Report #1, Brussels: European Centre for the Strategic Management of Universities.
http://www.highereducationmanagement.eu/images/stories/MODERN_Report_Governance.pdf
- Burrows, J. (1999), Going beyond labels: a framework for profiling institutional stakeholders, Contemporary Education, Vol. 70, No. 4, pp. 5-10.
- Bush, V. (1945) Science: the endless frontier, Washington: United States Government Printing Office.
- Centre for Educational research and innovation (1982) The university and the community: the problems of changing relationships, Paris: OECD.
- Charles, D. & Wray, F. (2010) Science cities in the UK, paper presented to 3rd Melbourne Knowledge Summit, Melbourne (Aus), 16th-19th November 2010.
http://www.melbournknowledgesummit.com/portals/14/proceedings/documents/o8_Charles.pdf
- CHEPS, INCHER & NIFU-STEP (2009) Progress in higher education reform across Europe Governance Reform, Brussels: DG Education. Daalder, H. (1982) The sudden revolution and the sluggish aftermath: a retrospective since 1968. In H. Daalder and E. Shils (Eds.), Universities, Politicians and Bureaucrats: Europe and the United States. Cambridge University Press, Cambridge.
- CHERPA Network (2010) UMultirank: Project 'Design and Testing the Feasibility of a Multi-dimensional Global University Ranking, Interim progress report: Preparation of the pilot phase, Enschede: CHERPA Network.
<http://www.u-multirank.eu/project/U-Multirank%20Interim%20Report%202.pdf>
- Chesbrough, H. W. (2003) Open innovation: the new imperative for creating and profiting from technology, Cambridge, MA: Harvard University Press.
- Crossick, G. (2006) Knowledge transfer without widgets: the challenge of the creative economy, Lecture to the Royal Society of Arts, Leeds, 31st May 2006.
http://www.london.ac.uk/fileadmin/documents/about/vicechancellor/Knowledge_transfer_without_widgets.pdf

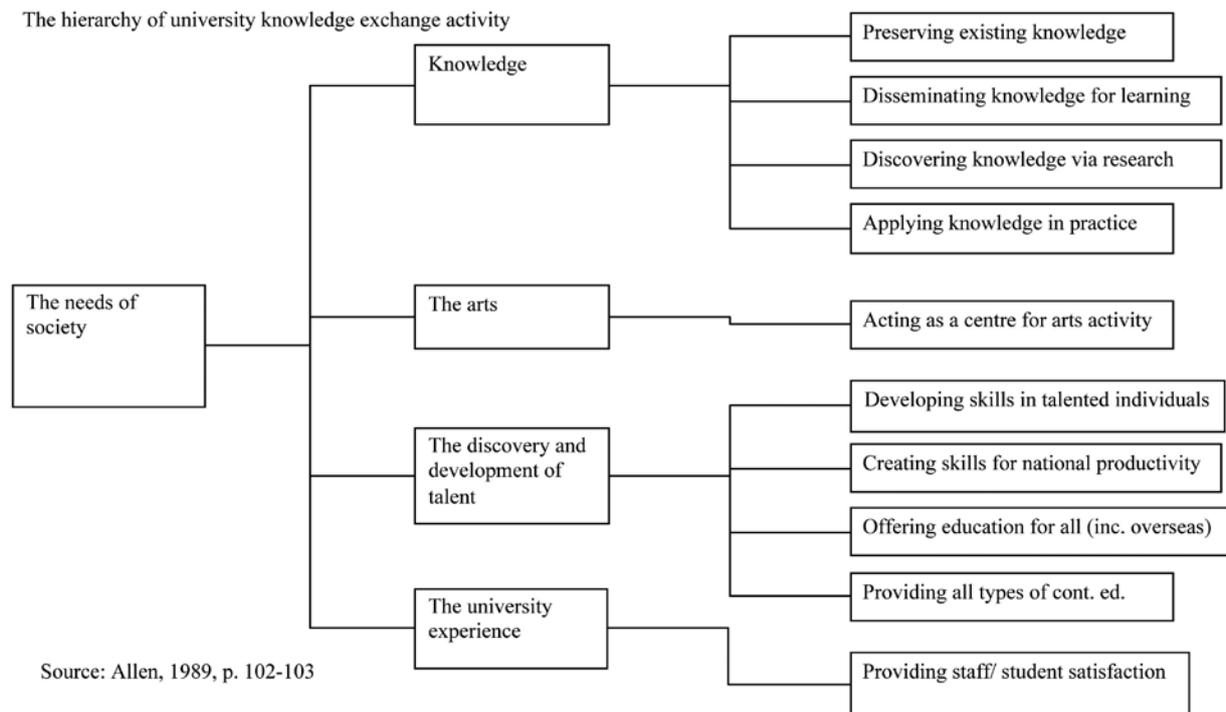
- Crossick, G. (2009) So who now believes in the transfer of widgets? , paper presented to Knowledge Futures Conference, Goldsmiths College, London, 16th-17th October 2009.
http://www.london.ac.uk/fileadmin/documents/about/vicechancellor/So_who_now_believes_in_the_transfer_of_widgets.pdf
- Dassen A. & Benneworth, P. (2011) Understanding the limits to higher education policy networks, in J. Enders, H. F. de Boer & D. Westerheijden (eds) Reform of higher education in Europe, Rotterdam, Sense Publishers.
- Delanty, G. (2002) The University and Modernity: A History of the Present, Pp. 31-48. In: The Virtual University? Information, Markets and Management K. Robins & F. Webster (eds) Oxford: Oxford University Press.
- Deitrick, S. & Soska, T. (2005) The University of Pittsburgh and the Oakland Neighbourhood: From Conflict to Cooperation or How the 800-Pound Gorilla Learned to Sit with—and not on—its Neighbours, in D. C. Perry & W. Wiewel (sds.), The University as Urban Developer: Case Studies and Analysis, New York: M.E Sharpe.
- DC RESEARCH (2009) Metrics for Knowledge Transfer from Public Research Organisations in Europe, Report from the European Commission's Expert Group on Knowledge Transfer Metrics, Brussels, CEC.
http://ec.europa.eu/invest-in-research/pdf/download_en/knowledge_transfer_web.pdf
- Durodié, B. (2003) Limitations of public dialogue in science and the rise of new 'experts', Critical Review of International Social and Political Philosophy, 6(4), pp. 82-92.
- Eisenhardt, K. (1989) Agency theory: An assessment and review, Academy of Management Review, 14 (1): 57-74.
- Etzkowitz, H. (2008) The Triple Helix: University-Industry-Government Innovation In Action, London: Routledge.
- European Commission (2010) Europe 2020: A European strategy for smart, sustainable and inclusive growth, Brussels: CEC, COM (2010) 2020.
http://europa.eu/press_room/pdf/complet_en_barroso__007_-_europe_2020_-_en_version.pdf
- Feldman, M. & Desrochers, P. (2003) Research universities and local economic development: lessons from the history of Johns Hopkins University, Industry and Innovation 10 (1) pp 5-24.
- Garvin, D.A. (1993) Building a learning organisation, Harvard Business Review July-August, pp. 78-91.
- Gibbons, M, Limoges, C., Nowotny, H. Schwartzman, S., Scott, P., & Trow, M. (1994) The new production of knowledge: the dynamics of science and research in contemporary societies, London: Sage.
- Gillies, M. (20110) University Governance: Questions for a New Era, HEPI Working Paper 3/2011, London: Higher Education Policy Institute.
<http://www.hepi.ac.uk/files/UniversityGovernance.pdf>
- Gunasekara, C. (2006) Reframing the role of universities in the development of regional innovation systems, Journal of technology transfer 31 (1) pp. 101-111.
- Haas, P. M. (1992) Epistemic Communities and International Policy Coordination, International Organization. 46(1) pp. 1-35.
- Hermansson, K., Lisenkova, K., McGregor, P & Swales, J. K. (2011) The expenditure impacts of individual higher education institutions (HEIs) and their students on the Scottish Economy under Devolution: homogeneity or heterogeneity?, Regional Impacts of HEIs Working Paper 12, Strahclyde: Impact HEI.
<http://www.impact-hei.ac.uk/Portals/8/HEI%20disaggregated%20Scottish%2010%20Discussion%20Paper%2010-16.pdf>
- Hippel E. von (2006) Democratizing innovation, Cambridge, MA: MIT Press.
- Jongbloed, B. (2010) Funding higher education: a view from across Europe, MODERN Executive Report #2 Brussels: European Centre for the Strategic Management of Universities.
http://www.highereducationmanagement.eu/images/stories/MODERN_Funding_Report.pdf
- Jongbloed, B. & L. Goedegebuure (2001), From the Entrepreneurial University to the Stakeholder University. Proceedings of the International Congress on "Universities and Regional development in the Knowledge Society, Universitat Politècnica de Catalunya Barcelona, 12-14 November 2001.
- Jongbloed, B., Enders, J., & Salerno, C. (2008), Higher education and its communities: Interconnections, interdependencies and a research agenda, Higher Education, 56 (3), pp. 303-324.
- Jongbloed, B. & Benneworth, P. (2011) Learning from history Previous attempts to measure universities' community impacts, in P. Benneworth (ed). University engagement with socially excluded communities, Dordrecht: Springer Verlag (forthcoming).

- Kickert, W. (1995), *Steering at a Distance: A New Paradigm of Public Governance in Dutch Higher Education*, *Governance*, 8: 135-157.
- Kickert, W. J. M., Klijn, E. H., & Koppenjan, J. F. M. (Eds.). (1997), *Managing Complex Networks, Strategies for the Public Sector* (1st ed.). London: SAGE Publications.
- Koppenjan, J. F. M. and E. H. Klijn (2004a), *Managing Uncertainties in Networks*, London, Routledge.
- Kellogg Commission (1999) *Returning to Our Roots: The Engaged Institution*, Third report of the Kellogg Commission, Washington DC: National Association of State Universities and Land-Grant Colleges, available online at: <http://www.nasulgc.org/NetCommunity/Document.Doc?id=183>
- Kline, S. J. & Rosenberg, N. (1986) *An overview of innovation*, in R. Landau and N. Rosenberg, *The positive sum strategy*, Washington DC: National Academy Press.
- Kolmos, A., Fink, F. K. & Krogh, L. (2004) *The Aalborg model: problem-based and project organised learning*, in A. Kolmos, F. K. Fink, & L. Krogh (eds) *The Aalborg PBL model: Progress, diversity and Challenges*, Aalborg, DK: Aalborg University Press.
- Larédo, P. (2007) *Revisiting the Third Mission of Universities: Toward a Renewed Categorization of University Activities?*, *Higher Education Policy* (2007) 20, pp. 441-456
- Latour, B. & Woolgar, S. (1979) *Laboratory life: the social construction of scientific facts*, London: Sage.
- Lee, J. N. (2001) *The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success*, *Information & Management*, 38 (5) pp. 323-335.
- Maassen, P.A. M. (1996) *Governmental Steering and the Academic Culture*, *De Tijdstroom*, Utrecht (NL).
- Malecki, E. (1997) *Technology and economic development*, London: Longmans. Massey, D., Quintas, P. & Wield, D. (1992) *Hi-technology fantasies*. London: Routledge.
- Mitchell, R.K., Agle, B.R., & Wood, D.J. (1997), *Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts*, *Academy of Management Review*, Vol. 22, No. 4, pp. 853-886.
- Mowery D.C., R.R. Nelson, B.N. Sampat, A.A. Ziedonis (2001), *The growth of patenting and licensing by U.S. universities: an assessment of the effects of the Bayh-Dole act of 1980*, *Research Policy*, 30, 99- 119.
- Nonaka, I. & Takeuchi, H. (1995), *The knowledge creating company: how Japanese companies create the dynamics of innovation*, New York: Oxford University Press.
- Nonaka I. & Toyama R. (2003) *The knowledge-creating theory revisited: knowledge creation as a synthesizing process*, *Knowledge Management Research & Practice*, 1(1) pp. 2 10.
- Novotny, H., Scott, P & Gibbons, M. (2003) *'Mode 2' Revisited: The New Production of Knowledge*, *Minerva* 41 pp. 179-194.
- OECD (2007) *Higher education and regions: globally competitive, regionally engaged*, Paris, OECD/ IMHE.
- OECD (2008), *Tertiary Education for the Knowledge Society: VOLUME 1: Special features: Governance, Funding, Quality*, Paris: Organisation for Economic Co-operation and Development.
- Office of University Partnerships (1999) *University Community Partnerships—Current Practices*, Volume 3, available online at: <http://www.oup.org/files/pubs/currentpractices3.pdf>.
- PACEC & CBR (2009) *The structure and evolution of the system of knowledge exchange infrastructure*, Report to HEFCE, Cambridge: PACEC/ Centre for Business Research. http://www.pacec.co.uk/reports/Understanding_the_Knowledge_Exchange_Infrastructure_in_the_English_Higher_Education_Sector.pdf
- Paavola, S., Lipponen. L. & Hakkarainen, K. (2004) *Models of Innovative Knowledge Communities and Three Metaphors of Learning*, *Review of Education Research* 74 (4), pp. 557-576.
- Perry, B. & May, T. (2010a) *Urban knowledge exchange: devilish dichotomies and active intermediation*, *International Journal of Knowledge-based Development* 1(1/2), pp. 6-24.
- Powell, J. & Dayson, K. (2011) *Engagement and the idea of the Civic University*, in Benneworth, P. (ed.) *Universities Engagement with Socially Excluded Communities*, Dordrecht: Springer.

- Quotec** (2009) Experimental Third Stream Strategic Development Fund Projects (Study B), Final Evaluation Report to HEFCE, Amersham, Bucks: Quotec.
http://www.hefce.ac.uk/pubs/rdreports/2009/rd19_09/rd19_09.pdf
- Senge, P.** (1990) *The Fifth Discipline: The art and practice of the learning organization*, New York, USA: Doubleday.
- Smith, A. & Webster F.** (1997) Changing ideas of the university, in A. Smith & F. Webster (eds), *The post-modern university? Contested visions of higher education in society*, Milton Keynes: Open University Press.
- U-MAP** (2008) *Mapping diversity? Developing a European classification of higher education institutions*, Enschede: 2008
http://www.u-map.org/U-MAP_report.pdf
- Universities UK** (2009) *The impact of universities on the UK economy , 4th report*, London: Universities UK.
<http://www.universitiesuk.ac.uk/Publications/Documents/EconomicImpact4Full.pdf>
- Wedgwood, M.** (2006) *Mainstreaming the third stream* in I. McNay (ed). *Beyond mass higher education: building on experience*, Maidenhead: SRHE, Open University Press
- Wenger, E.** (1998) *Communities of practice*, Cambridge University Press, Cambridge (UK).
- Yli-Renko, H. Autio, E. & Sapienza, H. J.** (2001) Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms, *Strategic Management Journal* 22(6-7) pp. 587–613.

10. APPENDICES

APPENDIX 1. A HIERARCHY OF UNIVERSITY KNOWLEDGE EXCHANGE ACTIVITIES



APPENDIX 2. DEFINITIONS OF UNIVERSITY/ COMMUNITY ENGAGEMENT

From University Community Partnerships—Current Practices Volume 3.

“Service Learning” contains descriptions of university programs in which students engage in service activities for credit as part of their coursework. Service learning activities may consist of actual coursework or the provision of a community service that is related to a specific course of study. Generally, service learning requires students to reflect, write, or otherwise develop their understanding of the issues they have encountered through their work.

“Service Provision” describes non-credit student and faculty initiatives that take the form of coordinated, sustained, long-term projects targeted to a specific community. These activities are designed to foster and nurture community partnerships that benefit everyone involved.

“Faculty Involvement” profiles faculty members who embody the driving force behind activities within the community. These activities are not necessarily related to course work. Instead, they are often related to an area of interest that generally addresses a faculty member’s established professional development goal.

“Student Volunteerism” includes tasks driven primarily by students. These activities are short in duration, unrelated to course work, and provide students with worthwhile positive experiences while allowing them to fulfil non-credit graduation requirements of volunteerism in community development.

“The Community in the Classroom” category depicts specific courses for local residents designed to enhance community building and community capacity. These are non-degree, non-credit courses that support the institution’s outreach mission.

“Applied Research” describes specific, defined, pragmatic data collection, analysis, and reporting. The purpose of this targeted research is to define needs, guide program planning, assess outcomes, or otherwise contribute to efforts to improve conditions within the community.

“Major Institutional Change” portrays initiatives that change the mission, promotion and tenure criteria, awards, and course offerings of colleges and universities. A specific activity may even overhaul administrative processes to meet an institution-community goal.”

Source: Office of University Partnerships, 1999, p. 3.



modern oo
EUROPEAN PLATFORM
HIGHER EDUCATION MODERNISATION

