

COMING TO TERMS

with
**Knowledge Brokering
and Translation**

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BACKGROUND PAPER

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Case Studies in Knowledge Brokering and Translation

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Coming to Terms with Knowledge Brokering and Translation

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INTRODUCTION AND BACKGROUND

The purpose of this paper is to clarify terminology and raise key questions in order to provide a shared starting point for discussions amongst participants in the workshop 'Case Studies in Knowledge Brokering and Translation' to be held by the Institute for Culture and Society at UWS Parramatta campus on November 28, 2012.

Although a number of UWS academics conduct research under conventional paradigms in the lab, the clinic, the library and the database, many have also gained significant experience in the kind of research implied in the University's vision of 'Bringing knowledge to life in Greater Western Sydney through community and business engagement with our learning and our research', and its goals to 'Develop focused, relevant and world-class engaged research', including through 'effective research partnerships'.

UWS's success at achieving such objectives has been recognised, for example in the 2010 ERA exercise which accorded 'world class' status to the Centre for Cultural Research (now the Institute for Culture and Society), a pioneer in humanities research partnerships and applied cultural research. The strength of our University's relations with relevant regional industry, government, community and educational organisations was a major factor in its being selected as a Regional Centre of Excellence in Education for Sustainability by the University of the United Nations in 2012.

The championing of engaged research sometimes understates the messy nature of such enterprise. Engaged research involves the diversification of actors, new research practices, forms of knowledge and research outputs. However, despite institutional encouragement of engaged and relevant research, the reward structures for academic researchers remain individualised, focussed around conventional outcomes (conference papers, peer reviewed publications, grants and awards), and generally could do more to acknowledge the work of forming, developing and maintaining research partnerships. Whilst success in negotiating partnerships affects research outcomes, many reporting genres preclude communication about the context of knowledge production or the lessons learned in and about partnerships and collaborations.

This situation is changing as some disciplines and fields articulate explicit interests in aspects of knowledge brokering, such as 'translational research' in biomedicine or

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'transition management' in innovation and organisation studies—though such conversations are more often parallel than convergent. This discussion paper, along with recommended workshop readings, aims to provide a platform for workshop participants to exchange and compare ideas across fields and disciplines, and to advance our understandings of the contexts, processes and labours of knowledge production that are vital to the formation and effective functioning of partnerships and collaborations, even if they elude capture by standard research metrics.

Mode 1 and Mode 2 Knowledge

Part of the background to this workshop are the debates from the mid-1990s onwards about what is often called Mode 1 and Mode 2 research. The systematic organisation of university research since the mid-20th century was initially modelled on the disciplinary structures and research practices of science, argues Michael Gibbons (1997 after Gibbons et al. 1994), who calls this institutionalised academic-driven scientific approach 'Mode 1' knowledge production.

But complex real-world problems of the 21st century often engage knowledge producers besides university researchers, and discovering solutions requires expertise from more than one discipline or set of knowledge practices. Efforts to address such problems have generated new kinds of knowledge practitioners, and an identifiably different form of organised production of knowledge in a 'context of application'. This 'Mode 2' research tends to involve 'a wider, more temporary and heterogeneous set of practitioners, collaborating on a problem defined in a specific and localised context' (Gibbons 1997: 3), where its value is often assessed by other than purely scientific or disciplinary criteria.

Like any such dichotomy, the Mode 1/Mode 2 binary is a caricature that oversimplifies a much messier picture. Critiques of this characterisation note that vocational and professional disciplines—for example in the trades, teaching, law, medicine or nursing—have always straddled theoretical and applied knowledge (Symes 2000). Benoît Godin argues that there never was a 'pure' Mode 1 knowledge, but rather that 'Mode 1 corresponds perfectly to the scientists' conception of their own identity, their *desiderata*, and to their efforts to distance themselves from applied research' (Godin 1998: 469). Citing the heterogeneity of activities and sponsors within supposedly 'Mode 1' research, he suggests there is probably only one mode of research, 'Mode 2 – with a varying degree of heterogeneity over time' (478). Usher proposes it is 'more helpful' to see the two modes 'as always interlinked and inter-relational', with tensions between them that vary with context (Usher 2000: 102). His example is the Mode 2 knowledge partnership between the university, the external organisation, and the learner/worker in courses involving workplace learning: workplace learning undermines traditional academic authority, prompting renewed emphasis on academic credentialing, but also leading to modifications to existing (disciplinary) university programs and assessments.

Like Usher, we find it helpful to consider the linkages and tensions between these two modes of knowledge production. Our own University's mission statement attempts to bring them together, aspiring to international excellence (Mode 1) as well as local relevance (Mode 2):

To be a university of international standing and outlook, achieving excellence through scholarship, teaching, learning, research and service to its regional, national and international communities, beginning with the people of Greater Western Sydney.

An academic at UWS might be teaching into a ‘disciplinary’ (Mode 1) undergraduate curriculum—or be making a disciplinary contribution to an interdisciplinary course—and also be carrying out Mode 2 research through a research centre or institute, or be involved in Mode 2 learning by brokering or overseeing workplace components of a degree. Mode 2 researchers are still evaluated against Mode 1 criteria of ‘excellence’: peer reviewed journal articles far outweigh project reports in standard research metrics. Part of the problem here is that the style and structure of scientific and technical reporting has become the norm across many disciplines, including some areas of social science, and is enforced in most types of government reporting. One effect is that distinctive ‘non-scientific’ features of Mode 2 knowledge production, such as processes of brokering partnerships, dealing with obstacles posed by organisations and personnel, and valuing local and context-specific knowledges, are often systematically written out when research is ‘written up’ for ‘objective’ project reports, scholarly publications, or research activity reporting. (UWS does however, internally reward community and external partner engagement.)

Notwithstanding the critiques of Gibbons et al., this discussion paper will continue to employ the term ‘Mode 2’ as convenient shorthand to refer to research that involves partners and stakeholders outside of the university, and/or researchers from more than one discipline or sector. In the Gibbons et al. model, the temporary, contingent, transdisciplinary partnerships of Mode 2 knowledge appear ‘heterarchical’ or even structure-less by comparison with the relatively stable disciplinary infrastructures for Mode 1 research. The ‘Knowledge Ecologies’ project (of which this workshop is a part) explores the proposition that Mode 2 knowledge is structured like an ecosystem: a heterogenous, dynamic, open-ended ecology in which diverse knowledge paradigms, disciplines, modalities, specialities and localities find their niches, co-evolve and form adaptive and contingent assemblages, and feed on, compete, collaborate, exchange or co-generate resources with each other.

Singular and Pluralist Epistemologies

Interdisciplinary teams are sometimes described as combinations of different skill or knowledge sets. However collaborations across the HASS/STEM divide² do not just bring together different knowledges, but different theories and understandings of what counts as knowledge, i.e. divergent epistemologies.

Science graduates are typically trained to value knowledge derived from properties of the object, as manifest, observed and recorded through controlled interactions with the scientific apparatus, where the scientist is the objective onlooker. While some social scientists also share these positivist epistemological commitments, social and cultural researchers employing qualitative and interpretive methods understand that knowledge of the object (or a research subject) is an outcome of the object’s interactions with its context *and* with researchers *and* their interpretive frameworks: ‘interpretive social scientists believe social researchers cannot take themselves outside of the social world in which they conduct research’ (Sharp 2012: 2). This entanglement in the research context means that ‘objective’ social observation is impossible; there can be no universally and singularly true knowledge of the object, but only multiple and situated knowledges and plural modalities of knowing.

A significant challenge for Mode 2 researchers is to bridge this gulf between the epistemological pluralism (or ‘relativism’) characteristic of the cultural research and interpretive social science, and the singular epistemology of positivist science, where

² HASS/STEM is another fuzzy and questionable binary that groups and divides academic disciplines: HASS or HSS = Humanities (Arts) and Social Sciences; STEM = Science, Technology, Engineering and Medicine (or Mathematics, in some definitions).

‘method’ means a ‘scientific method’ and implies strong claims to an objective grasp of ‘reality’. Faith in the positivist paradigm can make it difficult for some STEM researchers to acknowledge the validity of other types of knowledge modalities and methods: they can readily discredit interpretive knowledge for its ambiguities and pluralities or dismiss the evidence from case studies as merely ‘anecdotal’ or ‘subjective’. Social researchers can feel frustrated by positivists’ narrow and literal definitions of the ‘real’, the devalued status of qualitative and interpretive knowledges, and the expectation they will meekly generate social data in quasi-scientific form to help scientists solve problems that were defined without input from social experts (Sofoulis 2011: 42; Shove 2010: 1281-1283). On the other hand, interpretivist scholars sometimes dismiss or overlook important quantitative research on the basis that it fails to account for context—an unhelpful stance when tackling complex problems. So the challenge on both sides is to find ways to work productively and effectively with different modes of knowledge and different kinds of evidence, and to calibrate interpretations and other kinds of intelligence to their real-world applications.

There are individuals in every field who are capable of ‘thinking outside the square’ of their disciplinary training and to link up with other fields of knowledge or respect forms of knowledge beyond their own ken. The ability to operate effectively in an epistemologically diverse context would seem to be one of the ‘essential criteria’ for any researcher aspiring to be broker and translator of knowledge.

TERMS FOR KNOWLEDGE BROKERING & TRANSLATION

Given the extra-disciplinary character of Mode 2 processes and the inherently fluid, ‘fuzzy’ or ‘boundary-riding’ positions (Taylor 2009) of those who work across and between different knowledge frameworks, fields and sectors, it is unsurprising that a review of the literature on knowledge brokering and translation (Hugman 2012) reveals lack of agreement on the conceptual vocabulary and a good deal of overlap in the meanings of the assorted terms used to discuss knowledge partnerships in different research domains.

Therefore a necessary starting point for this workshop is that no participant—not even the convenors—can assume they have the best model or most adequate set of terms to describe these processes. The interest is where different approaches converge and diverge, what processes and actors they highlight or sideline, what disciplines or sectors they connect with. The workshop’s focus on case studies is intended to ground discussions in shared critical reflections on practical experience in interdisciplinary, multi-stakeholder and translational research. From this basis, we may be able to compare the adequacy of our different vocabularies and perspectives—or invent new ones—without getting too tangled in terminological disputes.

The extended glossary of ‘Knowledge Terms’ produced by Sky Hugman as part of her doctoral work in attachment to the ARC Linkage project *Young People, Technology and Wellbeing Research Facility* forms the main basis of the following section, reordered here to describe a loose trajectory from Mode 1-friendly to more Mode 2-compatible approaches.

Knowledge Integration

‘Knowledge integration’ is a deceptively straightforward term that people can share in conversations without realising how differently they understand its meanings. The notion of ‘knowledge integration’ is often closely linked to notions of interdisciplinary research, as in the US National Academies definition of ‘a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge ...’ (qtd by Bammer 2011: 1).

Ideas of interdisciplinarity and knowledge integration evoke hopes that bringing a variety of different knowledges to bear on a problem will lead to better understanding, generate innovations, and help find solutions to complex real-world problems (Bammer, 2011:1).

But there are different ways of staging the ‘integration’ of knowledges around a problem, as outlined by Stokols (2008: S79, qtd by Bammer 2012: n.5):

Multidisciplinarity is a **sequential** process whereby researchers in different disciplines work **independently**, each from his or her own discipline-specific perspective, with a goal of eventually combining efforts to address a common research problem.

Interdisciplinarity is an **interactive** process in which researchers work **jointly**, each drawing from his or her own discipline specific perspective, to address a common research problem.

Transdisciplinarity is an **integrative** process in which researchers work jointly to develop and use a shared conceptual framework that **synthesizes** and **extends** discipline-specific theories, concepts, methods, or all three to create **new** models and language to address a common research problem. [Bolding in original].

In practice, knowledge ‘integration’ may not involve much synthesis and can amount to little more than the assimilation of ‘minority’ knowledges into a dominant framework. For example in a recent discussion of Australian research infrastructures, an expert Environmental Group identified a priority need for ‘inter-disciplinary integration across natural and social sciences, economics and the humanities’ (DIISR 2011: 11). However, the ‘humanities’ soon dropped out of the picture:

... where social and economic drivers are key elements of the system, more attention is required on the collection of and/or access to key social and economic data that are sensitive to change in environmental condition or function. (14)

Instead of a transdisciplinary knowledge synthesis, the model of integration here is of the sequential multi-disciplinary type, where social sciences and economics researchers are reduced to providing ‘data inputs’ for the scientists to integrate into their systems models. This is the kind of approach that leads social and cultural researchers to complain about being brought onto water projects or planning exercises as an afterthought, to fulfil the need ‘for a bit of social science’ after the project scope, questions and methods had already been defined by scientists and engineers (Sofoulis 2011: 38-46).

Thus a key question whenever ‘knowledge integration’ is invoked is: at what stage does this integration occur?

Knowledge Dissemination

‘Knowledge dissemination’ and ‘research dissemination’ often refer to active processes in which new or existing knowledge, interventions, or practices are spread or circulated (Neuhauser 2010). Dissemination is a conventional concern of disciplinary research and outcome-focussed research metrics: the university is the centre of expert knowledge that is spread out through journal articles, conference presentations and other outputs.

Multi-stakeholder research may have greater interest in making knowledge accessible and usable outside academia. For example the Canadian Institute of Health Research defines knowledge dissemination as a process extending beyond scholarly journals and academic conferences, and promotes a strategy of extracting clear messages and key implications

from research, developing ways to deliver these messages, and communicating them to target groups of policy and decision-makers (and other stakeholders) in a form that will encourage them to take the research implications into account.

One obvious limitation of the dissemination model is its mono-directionality: knowledge flows from experts at the top down, or from the centre out, but not back the other way.

Knowledge Transfer

'Knowledge transfer' is an ill-defined but widely used term used that is often conceptualised as a process of transferring research into practice, and is sometimes used interchangeably with 'knowledge translation' or 'exchange'. Debates around knowledge transfer tend to occur in relation to the research and funding agenda in modern universities (Rynes, Bartunek and Daft 2001, Smith 2012), especially their interests in commercialising selected research results through venture capital funding. This model reflects a Mode 1 view of innovative research as a kind of relay race, according to Gibbons (1997: 8): university researchers do the discovering then, with some help, pass on the baton of commercialisable knowledge to industry, which takes it to the marketplace. Gibbons proposes that Mode 2 knowledge production is more like a soccer or basketball game, in which all players, including industry stakeholders, are active in the field and contribute throughout the whole game.

Smith argues that as concepts of knowledge transfer are being created in the context of deeply social processes invoked in concepts like value, culture, community, or industry, it is important to understand the narratives in which notions of knowledge transfer are embedded. Some narratives (e.g. commercial benefit, national security) have higher status or value than others, and they influence what kinds of knowledge are valued, adopted and attached to different forms of research (Smith 2012: 2); understanding them could help in identifying 'patterns and activities to enhance knowledge transfer practices' (3).

Knowledge Translation

Knowledge translation can be thought of as the art of weaving together processes of research and practice. The Canadian Health Services Research Report (2003) defines it as a dynamic iterative process that includes synthesis, exchange, dissemination and ethically sound applications of knowledge.

There is a proliferation of interchangeable terms around the concept of knowledge translation in different research fields, and maps and strategies for knowledge translation differ from sector to sector. Most discussions connect knowledge translation with ideas about linkage, exchange and communication. The literature on knowledge translation in the health and medical sciences stresses how to put abstract knowledge into practical and utilisable forms, highlighting the problem of 'bridging the know-do gap'. In education, a comparable problem is bridging the gap between pedagogical theory and classroom practice.

Aside from problems of translating research knowledge into effective practice *within* a particular field (e.g. medicine, nursing or teaching) there are problems of translating knowledge *between* different fields and sectors within research partnerships, including between epistemological pluralists and monists. For example, Sofoulis (2011: 38-39) found that water managers who commissioned qualitative social research expected it to be presented in a similar form to technical research, and as easily translated into organisational action as the engineering research they commissioned to solve technical problems. A current challenge for social and cultural researchers working in water, energy, sustainability

and climate change fields is how to represent and translate the perspectives and insights from qualitative social research into forms and terms that scientists, engineers and technocrats can understand and work with, while resisting efforts to collapse qualitative knowledge into literalist and positivist paradigms, including behaviourist psychology.

In contrast to the 'relay race' model of knowledge transfer by passing on the baton of commercialisable results, knowledge translation can mean that the baton changes shape as it passes into other contexts and is adapted by other hands. This is the sense emphasised by Latour (1986), who critiques the diffusion of innovations model, where an idea or technology ('the baton' or 'token') is endowed with its own reservoir of energy that enables it to spread more or less unchanged through the neutral medium of society, except when slowed by various kinds of resistance and distortions. His notion of translation, by contrast, stresses that 'the spread in time in space of anything—claims, orders, artefacts, goods—is in the hands of people; each of these people may act in many different ways, letting the token drop, or modifying it, or deflecting it, or betraying it, or adding to it, or appropriating it' (Latour 1986: 267). For Latour, then, translation is not so much a matter of giving energy to an idea to spread in society, but rather 'enrolling, convincing and enlisting' (273) the people who will add their own impetus to the token, and transform it in ways that suit their own local interests.

Knowledge Sharing

Compared to knowledge dissemination and transfer, the concept of 'knowledge sharing' allows for more multidirectional knowledge flows.

This concept has practical use in the information sciences, where the facilitation of knowledge sharing in open source IT systems and artificial intelligence is centred around conventions that aim to reuse knowledge bases and knowledge-based systems. Efforts are made to define, develop, and test knowledge infrastructure and technology to enable those involved to create something bigger than what would be achievable if working alone.

Knowledge sharing is also linked with the representation and circulation of knowledge in fields of business and organisational management (Masanori 2008), where interest in the concept has emerged out of concerns with technology transfer and innovation (Cummings 2003). Cummings argues that the study of knowledge sharing is essential to discovering the means by which an 'organisation obtains access to its own and other organisations' knowledge' (2003: 3), enabling it to create more efficient organisational and management systems. Knowledge sharing research in these fields is migrating into organisational learning perspectives that aim to understand the learning processes involved in successful knowledge sharing.

Social science approaches to knowledge sharing are usually conceptualised as the process of exchanging knowledge among researchers, policy makers, service providers and stakeholders such as parents, the public and others (Tsui et al. 2006). Such exchanges are seen to enhance the effectiveness of multi-sector teams and networks working in complex contexts: knowledge sharing creates a culture that encourages people to work together more effectively through collaboration (Tsui et al. 2006). Similar understandings of knowledge sharing can be found across the social, medical, philosophical, psychological and natural sciences, even if this exact term is not used. For example the recent collection by Brown, Harris and Russel (2010) is a transdisciplinary re-examination of the relations of social and academic discourse to real world complexities that advocates an epistemologically pluralist approach to complex problem solving, harnessing different views of the world as well as different ways of knowing that world (i.e. knowledge modalities).

Knowledge Brokering

Knowledge brokering can be seen as part of knowledge transfer processes, as it engages with obstacles that block transfer of research into practice. But knowledge brokering itself encompasses a wide range of processes and practices, including formal and informal activities that aim at establishing relationships and facilitating effective knowledge sharing and exchange (Cummings 2010). Knowledge brokering entails uncovering the needs, ideas, activities and processes of different knowledge environments in order to identify the best research, practices and tools that research partners need to capture, transfer, exchange and collaborate around knowledge (Cummings 2010: 39).

In so far as 'knowledge' is situational, complex and socially and culturally constructed, knowledge brokers need to be able to inhabit different worlds and diverse intellectual traditions, and to map the varying beliefs, values and practices of the knowledge environments inhabited by researchers, policy makers and other stakeholders. The personality of the knowledge broker is therefore of interest. For example, Cummings (2010) and Clarke and Kelly (2005) consider the personality of a knowledge broker as vital to any knowledge brokering exercise. Knowledge brokers are entrepreneurial, able to network, negotiate, mediate and facilitate relationship-building amongst partners, and are good at problem solving. As 'the human force' (Canadian Health Services Research Report 2003: 1) that makes knowledge transfer happen, knowledge brokers need to be clear communicators and be accepted by partners as trusted and credible individuals.

One question arising here is whether effective knowledge brokers might be made as well as 'born', whether through training programs or the creation of more jobs for skilled non-specialists who can broker research partnerships and knowledge exchanges. Another question concerns the possible role of knowledge brokering organisations that can bring together and mediate between stakeholders from different sectors, as for example in the various non-profit trusts of the UK that auspice research between government or industry partners and non-government or community organisations.

Knowledge Economy

Notions of the knowledge economy are anchored in a view of knowledge as a marketable commodity. This 'ultimate intangible' (Stewart 1994) is seen as the chief ingredient of a new economic reality where the 'knowledge economics' (Edvinsson 2000) values knowledge in terms of production, markets, trades, transactions and exchanges. A key element in this economy is 'intellectual capital', often defined as intellectual material that has been captured, formalised and then used as leverage for a higher value asset (Stewart 1994). Other meanings of intellectual capital include knowledge and experience that directly contributes to a company's bottom line (Leo 2010), or collective resources that determine the organisation's value and its competitiveness as an enterprise (Sullivan 2000).

Concerns of the knowledge economy converge with issues of knowledge transfer, sharing and brokerage, particularly around questions of how to effectively manage and utilise intellectual capital and knowledge flows within organisations, or how to improve knowledge sharing in order to implement organisational change (Huysman 2002). In this context, processes of knowledge exchange and knowledge sharing may be reduced to formulaic trading, as packages of knowledge (or the services of knowledge workers) are bought, sold, amalgamated or split and auctioned off, all at market-driven prices.

It is nearly two decades since Gibbons et al. (1994) described the knowledge economy as the economy of the intellectual. Does that descriptor apply to the current role and impacts of intellectual knowledge inside and outside of universities? As Smith (2010: 37) argues, it is

well known that universities have a critical role in the economy but much less is known about *how* transactions of knowledge between university, industry and government take place.

Knowledge Ecologies

Knowledge ecologies and knowledge ecosystems are mainly discussed in an interdisciplinary strand of management theory and practice that applies key ideas from ecosystems and life sciences, general systems theory, and new information and communications media, to understand and facilitate productive knowledge flows without trying to control knowledge outputs from the top down. As one definition has it:

"Knowledge ecology" is [...] focused on the relational and social aspects of knowledge creation and utilization. Its primary study and domain of action is the design and support of self-organizing knowledge ecosystems, providing the infrastructure in which information, ideas, and inspiration can travel freely to cross-fertilize and feed on each other. (Community Intelligence Labs, <http://www.co-i-l.com/coil/knowledge-garden/kd/index.shtml>.)

Another approach to the knowledge ecology idea is through the humanities, where ideas from ecological science and new media theory (especially the idea of 'media ecology') are brought into the mix with the speculative philosophy of Albert North Whitehead and more recent proponents of postdualistic, neomaterialist and systems-oriented approaches (such as Bateson, Haraway, Latour, Deleuze and Guattari). Epistemological pluralism is the core of this concept, where each knowledge framework illuminates as well as conceals different aspects of reality and 'no single mode of thought has a monopoly on the real; rather, every idea is partial and relative to its ecology, capable only of exposing certain features of a more complex landscape' (Adam Robbert blog, <http://knowledge-ecology.com/matter-media-and-mind/>).

The metaphor of a 'knowledge ecology' has appeal—at least to the workshop convenors—as an aid to imagining complex, multidirectional, dynamic, evolving and adaptive interactions among a diversity of knowledges and knowledge modalities, knowledge practices, and knowledge practitioners. Whereas the ideas of dissemination and knowledge transfer or translation presuppose that knowledge can be transposed to different contexts (perhaps via exchange into quanta of intellectual 'capital'?), in an epistemologically diverse ecology some kinds of knowledges are necessarily incommensurable with others, site-specific, non-transferable, or untranslatable into other knowledge frameworks or modalities. Acknowledging limits to translatability or equivalence of knowledges is important when it comes to respecting the knowledge of others, whether this is the embodied skill of a highly experienced surgeon, lab technician or machinist, or the knowledge traditions associated with completing claims for land, water and other resources in struggles between indigenous people, settler communities, corporations and governments.

CONCLUSION – AND FURTHER QUESTIONS

Irrespective of terminologies and approaches used, UWS researchers who help realize the institution's visions of 'Bringing knowledge to life ... through community and business engagement' and 'effective research partnerships' find ourselves in labour-intensive knowledge production processes that are rarely reported, counted or rewarded as research outcomes, though they are vital to project success. These processes may include:

- The work of bringing different people, disciplines and organisations into a research partnership, then developing and maintaining it;
- Negotiating to identify and frame research questions that are relevant to businesses, governments, communities and other stakeholders;
- Working productively with generational and cultural differences;
- Working through assumptions and negotiations around issues of research methods and the relative value of different kinds of knowledge;
- Overcoming or working around the internal or external obstacles to making collaborations and partnerships productive and effective;
- Choosing the platforms, genres and contents for the exchange and translation of knowledge within the partnership and beyond to other 'stakeholders';
- Trying to figure out criteria for evaluating the relevance, effectiveness and impact of partnerships and collaborations of different kinds (Bammer 2012: 17);
- Dealing with the constraints and enablements shaped by particular distributions of power, status, knowledge and resources at different scales and sites of knowledge production.

This last point is one from which most discussions of research collaborations shy away, preferring to invoke an ideal of integrating equally valued knowledges while ignoring their different resource bases. In their research on collaborations for innovation, Spoehr et al. (2010: 13) identified the undervaluation of humanities and social sciences compared to the sciences as the unmentionable 'elephant in the room'. For although many contributors from both HASS and STEM sectors were keen to make links between them, 'few acknowledge that HASS disciplines do not enjoy the high status afforded to STEM disciplines in the innovation debate' (Spoehr et al. 2010: 13). The issue of status is linked to inequalities in research and research infrastructure funding. For example, how the STEM sector with a little less than half of Australian researchers attracts over 90% of government research funding, leaving HASS researchers with just a third (proportionately) of the funds going to their European counterparts.³

By ignoring power/knowledge relations in Mode 2 knowledge production, we reduce rather than expand our understanding of the forms of knowledge brokering, production and translation in which we are engaged. Therefore we encourage workshop participants to be alert to the operations of power as reflected in differences in status, resources and authority of different kinds of knowledge and knowers. As a way of teasing out some of those dimensions, we invite consideration of questions grouped under the four themes of Languages, Knowers and Actors, Boundaries of Knowledge, and Modalities of Knowledge.

In exploring these thematic questions at the 'Case Studies in Knowledge Brokering and Translation' Workshop, we hope to generate lively discussions and collectively learn more about the various knowledge production processes in which we are engaged.

³ In the financial year 2008-09, all the HASS fields, plus education, economics, business/commerce, and design and the built environment together attracted a total of 5% of the Australian government's research funding, with 95% going to STEM research. Engineering alone attracted 17.9% (\$610.7M), 12 times more than the best-funded HASS field (Studies in Human Society) and 265 times more than Language, Communication and Culture (ABS, 2010: 12-13).

Languages

Multidisciplinary and cross-sectoral projects—including this workshop—may bring together ‘polylingual’ assemblages of people who do not necessarily share a common language, either about the research topic, the nature of knowledge, or knowledge brokering processes. Hence, a common language or shared understanding of a problem is more likely to be a project achievement than a starting point. Yet somehow, communication and knowledge sharing needs to take place amongst these heterogenous knowledge producers through language. The workshop’s emphasis on case studies is based on the idea that by grounding discussions in shared reflections on research practice, we might begin to develop shared understandings while being freer to think critically about different terminologies, or perhaps invent new ones.

- What are the noticeable differences between different languages and perspectives for talking about research partnerships? Compare, for example, your field’s knowledge brokering terminology with the languages of the recommended workshop readings *Attraction of Strangers* (Cassidy and Ang 2004) and *A Handbook for Knowledge Sharing* (Tsui 2006).
- Are our vocabularies and frameworks for talking about knowledge brokering or translation adequate to describe what researchers are doing? Do we need some other language?
- How can researchers communicate across different paradigms – for example, between positivist and interpretive frameworks, or between epistemologically singular and pluralist standpoints?
- What openings are there within sciences for those searching for new languages or developing a common language with other disciplines and paradigms? What openings are there in the humanities, arts and social sciences?

Knowers and Actors

Reflecting the idealist traditions of western philosophy, and the more recent scientific ideas of universal and reproducible knowledge, there is a tendency in debates about knowledge, the university and society for ‘knowledge’ to be treated as some abstract or universal substance that can be moved around and passed on almost irrespective of the ‘knowers’. But where the emphasis is on knowledge production in specific contexts of application by particular and contingent assemblages of researchers and stakeholders (Mode 2), knowledge is not so readily separable from the knowers or the contexts of its production.

- Who are the ‘agents’ of knowledge brokering processes? What are the roles of individuals, collectives, institutions and networks?
- What are the unspoken terms and assumptions of knowledge brokering practice? What kinds of knowers (and knowledges) are included or excluded? Who is brought in at the scoping phase of projects or left out until the final stages? Who is included as a stakeholder in the research and its outcomes? Who is overlooked, excluded, or invoked only as an imaginary or hypothetical figure (like the hypothetical ‘reasonable man’, defined in British legal convention as a passenger on the Clapham omnibus)?
- Is there a special role for humanities and social sciences researchers in brokering knowledge partnerships? What other fields might have special contributions?

- How do practices of knowledge brokering and multi-stakeholder partnerships, and new media and knowledge ecologies, transform our notions about knowledge, research, and researchers?

Boundaries of Knowledge

Bringing together researchers from different disciplines and organisations into a productive knowledge partnership can be a delicate diplomatic exercise in managing boundary anxieties. Even when people want to work together on a problem, they may encounter fraught issues around the degrees of independence and overlap of expertise team members have in relation to different parts of the problem or project, or different sets of data. Respect for each others' expertise may be asymmetrical rather than mutual—for example social scientists never claim to be engineers, but some scientists and engineers claim to do social research (usually via an end-user survey added onto a scientific or technical project). Different partners may not share the same views of which factors or variables are salient to the problem being investigated, what methods of investigation are appropriate, what counts as evidence, or how much control ought to be exerted over flows of knowledge within and outside the group.

- How and by whom are disciplinary boundaries drawn in relation to knowledge partnerships? How and by whom are these boundaries challenged or redrawn? Do the different researchers mutually respect each others' expertise?
- What happens to data, evidence or qualitative knowledge when it passes—or is translated—into a different discursive or disciplinary context? Can its complexity be preserved? Should it be?
- What kind of knowledge crosses boundaries? What kinds are untranslatable or non-transferable?

Modalities of Knowledge

Two concepts of modality are relevant here, anchored respectively in educational psychology and sociolinguistics. The first distinguishes knowledges in terms of the various cognitive, sensory, and physical faculties involved in generating that knowledge—as a very general example, theoretical versus experimental versus practical or applied knowledge. The second concerns the degree of realism, certainty or truth value of knowledge claims, comparable to utterances of low modality such as *<it might be>* versus high modality statements like *<it certainly is>*. One of the challenges of multidisciplinary or Mode 2 projects is that because scientists usually lay claim to the highest modality knowledge, it is hard for researchers using qualitative methods and interpretive paradigms to get their 'lower modality' forms of knowledge accepted as valid or of comparable worth.

- What kinds of power relations are involved when different kinds of knowledges are brought together? Which ones have most sway in determining standards of evidence or choice of methods?
- What is the relative status of different kinds of knowledge that are brought into collaborative projects? Is emergent knowledge recognised or valued—and by whom?
- How do new media ecologies alter the sources and kinds of knowledge available to researchers? How might new information and communication technologies change the researcher/researched or knower/known relationship?

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* **NOTE: Asterisked and bold references** are recommended pre-workshop readings downloadable from http://www.uws.edu.au/ics/events/knowledge_ecologies.

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APPENDIX: QUESTIONS FOR CASE STUDIES

Aside from the researchers presenting 10 minute case studies, it would be helpful if all participants took a little time beforehand to think about one of their projects as a case study, either in relation to the larger thematic questions or the following more specific ones.

- What was at stake in processes of knowledge brokering or knowledge translation for your project?
- Who were/are the 'agents' of the knowledge brokering processes? What were those processes, precisely? Which were formal and which informal? Did some dominate and why?
- Did a 'knowledge brokering' approach, or commitment to knowledge translation, alter the scope or character of the research problem or change the method and aims?
- What were the unspoken terms of knowledge brokering and translation practices?
 - What were the conditions that encouraged knowledge brokering to happen?
 - What ground rules or players were assumed in the process?
 - Which directions did translation go in – from which kinds of knowledge and knowers to which others?
- What were the explicit negotiations, tacit understandings or implicit rules about which kinds of knowers and knowledges were to be included or excluded at different points in the brokering or translation process?
 - What kinds of knowers or knowledge were included or excluded at the outset? At final reporting? In the knowledge translations?
 - Did other players need to be engaged at some later stage?
 - Were some knowledges untranslatable or unacknowledgable?
 - What knowledge could not be passed on beyond the project?
- What was the biggest challenge of the knowledge brokering aspects of the project or the processes involved in translating knowledge to other domains?
- Did the process generate knowledge that otherwise would not have been produced?
- Were knowledge brokers and translators appropriately acknowledged or rewarded?