
practice

Development of a framework for knowledge mobilisation and impact competencies

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For research to translate into impact, knowledge must be effectively mobilised beyond the academic domain. However, there is little consensus on the competencies (skills) required. This paper describes the development of a competency framework. Four existing knowledge broker frameworks were synthesised through a process of (1) extraction, (2) categorisation, (3) cleaning and (4) re-categorisation. A final set of 80 distinct, actively-phrased competencies in 11 categories was produced. This paper provides the first comprehensive framework for professional competences for impact beyond commercialisation. The potential applications, implications for competencies and associated competence alongside further research are discussed.

key words knowledge mobilisation • research impact • competencies • framework

Background and previous work

There is a growing expectation that academic research should translate into tangible real-world benefit including impacts on society, health and the environment as well as commercially driven economic impacts (Watermeyer, 2014a). The dual-funding process in the UK (see Hughes et al, 2013) has catapulted impact to an increasingly prominent national position, with impact arguably most substantially driven by its introduction as a 20% weighted component in the 2014 Research Excellence Framework (REF) (Watermeyer, 2012). However, despite a range of frameworks for both impact and knowledge mobilisation (for example, Panel on Return on Investment in Health Research, 2009; Frank and Nason, 2009; Co-produced pathway to impact, Phipps et al, 2016; Payback Framework, Buxton and Hanney, 1996) there remains a gap in understanding the specific competencies needed to successfully translate research into impact. Brokering research knowledge into social practice

is a highly effortful and complex activity; without sufficient focus on skills, both institutions and individuals may be under-equipped to generate impact effectively.

Impact is defined by the Higher Education Funding Council of England (HEFCE) as ‘an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia’ (Higher Education Funding Council for England, 2011). Similarly, competitive Research Councils’ grant schemes require strong ‘Pathways to Impact’ statements (see www.rcuk.ac.uk/innovation/impacts) to secure funding and deliver tangible benefits from discrete programmes of research. Accordingly, the significance of impact has ascended rapidly and prompted sizeable institutional and individual commitment in the years since. Internationally, research is arguably less impact-centric; for example in contrast to the UK’s assessment-driven agenda, Canadian research is guided by funder mandates for knowledge mobilisation (in social sciences and humanities, www.sshrc-crsh.gc.ca), knowledge translation (in health, www.cihr-irsc.gc.ca) and commercialisation (natural sciences and engineering, www.nserc-crsng.gc.ca). Knowledge mobilisation (KMb) is the process of connecting research and researcher expertise to individuals or organisations seeking to make evidence-informed decisions about public policy, professional practice and social services for primarily social and/or environmental benefits. Such activities may be framed under a multiplicity of terms including knowledge exchange, research impact, public engagement and/or evidence-informed policy and practice (Estabrooks et al, 2008; Graham et al, 2006; Graham, Tetroe, and the KT Theories Research Group, 2007; Ward, House and Hamer, 2009a), and supported by a diversity of methods and tools as exemplified by the Knowledge Translation Registry of methods and tools for public health (www.nccmt.ca/resources/registry). Regardless of the terminology, KMb helps to translate research outwardly into a variety of impacts. However, in contrast to linear models of knowledge transfer used in technology commercialisation, KMb practice is far less unidirectional and reflects a more socially engaged process (Greenhalgh and Wieringa, 2011). Research that can inform public policy, professional practice or social services often requires more iterative, multi-perspective and multi-partner efforts (Lang and Hardwick, 2016; Phipps et al, 2016).

An assessment-driven paradigm (that is, REF) which is retrospectively focused on existing research impacts can mask the skills required to broker research knowledge and collaborations to generate future impacts. Whilst academic researchers themselves are increasingly expected to create impacts from their research, they are often poorly equipped to plan for and collect the evidence of the effects (Watermeyer, 2014b). Research institutions are investing in staff to support these activities in roles such as knowledge brokers, public engagement officers and research impact officers. Within this paper, we collectively describe these individuals as *research impact practitioners* and include academic and non-academic staff as well as students who work to create or support the creation of impacts derived from academic research. Such roles have been described at the University of Edinburgh (Knight and Lightowler, 2010) and in the Canadian healthcare system (Lomas, 2007). Beyond role descriptions, Ward and colleagues (2009b) described some of the functions of knowledge brokers seeking to forge collaborations between research and practice. These include information management, capacity building, linkage and exchange. The Canadian Health Services Research Foundation (CHSRF, 2003) recognised important personal qualities for these roles such as an imaginative, intuitive, and inquisitive nature, and the ability to be an

inspirational leader. Building on these characteristics, Stetler and colleagues (2011) identified a number of qualities that are important for facilitating implementation of research evidence into practice / policy, including: authenticity, realness and openness; respect and general credibility; accessibility, approachability, and empathy; flexibility; responsiveness and reliability; and, self-confidence. Phipps and Morton (2013) also identified seven qualities of knowledge brokers including: nimble / flexible; enthusiastic; creative; communicator / listener; courage; tact; and, tireless commitment. However, outside of identifying roles, functions and qualities of knowledge brokers there has been little work on the job-related competencies (that is, skills as opposed to personal characteristics) required.

Identifying and then building impact competencies is complicated by several factors. Firstly, diffusing functions across multiple job roles dilutes 'impact specialist' as a professional identity. Secondly, there is thus little consensus on job titles, extensive variation in expectations and limited coherence in career pathways. Thirdly, with a diverse and unstandardised vocabulary to describe the nature of KMB activity, it is hard to build a taxonomy of functions and their effectiveness / appropriateness of application. Fourthly, with insufficient understanding of the competencies required by research impact practitioners (including academic researchers generating impact as a function of their research), recruitment and professional development practices are weakened. Finally, a 'know-do gap' exists if research impact practitioners are not sufficiently 'impact-literate' (that is, comprehending how methods to create impact ('how'), are integrated by practitioners ('who') to result in measurable endpoints ('what'); for a full description see Bayley and Phipps, forthcoming). Impact literacy enables critical and comprehensive decision making about pathways, stakeholder engagement and impact goals; without literacy, potential impact may be diluted (limited effects), misguided (poorly targeted at stakeholders), or missed altogether (for example, potential pathways not identified). Thus, for impact practitioners to perform effectively, they must be competent in the appropriate skills, and sufficiently impact-literate to apply these effectively in practice. Alongside strengthening impact literacy, enabling research impact requires that appropriate skills be established, developed, maintained and enhanced. With universities committing ever more resources to comply with research impact agendas, it is increasingly important to understand the skills needed to successfully support research impact.

This lack of focus on KMB skills across the research sector, and moreover the absence of a comprehensive competency framework for non-commercial research translation, was identified at the UK Knowledge Mobilisation Forum 2015 (<http://knowledgemobilisation.net/ukkmbf15>). A group of ten KMB practitioners (including self-identified researchers, public engagement officers, knowledge brokers and librarians) began a discussion on human resources for KMB. This conversation gravitated to the need to identify knowledge broker competencies as a preliminary step to developing capacity for these roles. Given the paucity of information on the precise skills required, the first obligation was to develop a core list of competencies. The benefits of such a framework are threefold. Firstly, it provides a comprehensive and standardised framework against which to understand operational requirements. In short, it offers a checklist of skills that may be needed for effective KMB. Secondly, it offers a means to establish the extent of existing competencies and develop effective capacity building initiatives. Thirdly, it supports the development of skills-based professional identities in a domain which is littered with non-standard and changeable

roles. It is important to note that such a framework reflects *competencies* (the skills needed to mobilise knowledge) but does not address *competence* (how capable an individual is in performing that skill); the former is a prerequisite for the latter. This paper outlines the synthesis of existing knowledge into a KMb *competencies* framework. Levels of associated *competence* are not presumed but are discussed later. This paper is the first attempt to connect disparate articulations of KMb competencies and consolidate them into a single comprehensive framework. The overall aim of this study was to identify and consolidate existing knowledge into a single resource, and the process of synthesis and refinement is presented.

Synthesis methods

A stepwise and iterative desk-based three-stage review process was undertaken. The stages and associated refinements to competencies and categories are shown in Figure 1. At all stages, decisions were made by discussion within the research team until consensus was reached. Such decisions were guided by the team's experience of knowledge brokering and impact in the academic sector, and with reference to external literature. Twice during deliberations (summer 2015) the research team re-engaged the original working group to validate the consensus.

Figure 1: Consolidation and synthesis process

Step	Details	Discrete competencies (n)	Categories (n)
1. Identification	Stakeholder consultation (UK KMb 2015) Four non-commercial frameworks identified	-	-
2. Synthesis	a) Extraction Individual competencies extracted from each framework. Duplicates combined / merged into single items	94	0
	b) Provisional categorisation Thematic grouping of competencies into skill categories	94	17
	c) Cleaning Change phrasing to standardise wording, further duplicate removal / merging. Wording readjusted to provide discrete and action based statements.	80	17
	d) Re-categorisation Review of categories and remaining competencies; reduction of categories	80	11
3. Production of final competency set		80	11

Step 1: Identification and selection of existing frameworks

First, existing knowledge broker competency frameworks were identified. An initial committee of ten people (eight UK, two Canadian), formed at the 2015 UK KMb Forum, were asked to identify known competency sets for non-commercial knowledge brokerage. To be eligible for inclusion, frameworks had to consist of skills relevant for the brokerage, exchange or transfer of academic research into non-commercial real world usage, and not on skills for commercialisation *only*. As such, competency frameworks based solely on commercialisation were not included in the review. Intellectual property (IP) related competencies identified within included frameworks however were ultimately retained to reflect processes associated with the development of non-profit research outputs. Four frameworks were identified through this consultation process from knowledge translation practice, library science, public engagement and dementia research. This qualitative stakeholder feedback was supplemented with a literature search, wider online search and broader request for frameworks across the knowledge mobilisation community but no further competency sets were found. The four frameworks are detailed in Table 1.

Table 1: Frameworks identified

Author	Framework title	Brief summary	Published / unpublished
Barwick	Building capacity for knowledge translation practitioners in Canada	Submitted manuscript describing results of a survey of Canadian knowledge translation practitioners	Unpublished 2014, obtained via personal communication
NHS Scotland	A capability framework for NHS Scotland's knowledge broker network: Working together to translate knowledge into action to improve Scotland's health and care	Competency framework for librarians as knowledge brokers in NHS Education for Scotland	Unpublished 2012, obtained via personal communication
Harris and Lusk	Canadian knowledge brokering core competency framework	Competency framework from the Canadian Dementia Knowledge Translation Network	Published in 2010
Stevens	Change agency and public engagement	A framework of the varied job functions, competencies and competences core to public engagement with research change agency activities	Unpublished, 2015 (co-author)

Step 2: Synthesis

Once identified, the content of these four frameworks was synthesised into a single list through four sequential stages:

1. Extraction

First, a master competencies list was produced by extracting all skills listed in each framework. Duplicate items were removed, and highly similarly worded items were merged. For example: 'Links decision makers, researchers, and care providers with each other' (Harris) was joined with 'finding and engaging with non-academic partners' (Barwick) for the final, synthesised competency 'finding and engaging with non-academic partners'. Where an extracted item combined two elements this was split into separate items. The extraction process produced 94 discrete competencies.

2. Provisional categorisation

Next, these 94 competencies were thematically and iteratively grouped into 17 provisional higher-order categories (see Table 2) through a process of co-review (two researchers in consultation, subsequently agreed by the team). For example, 'knowledge translation in practice' (Barwick), 'Supports the accessibility of quality evidence through the design and development of products, learning series, resource collections' (Harris), and 'Supporting therapeutic use of information and knowledge' (Wales) were all categorised into 'Creating and using KT tools, products and practices'.

3. Cleaning

Thirdly, all competencies were reviewed again within their assigned categories to ensure they were: (1) a discrete competency within that category; (2) actively phrased to reflect the performance of a skill; and (3) not duplicated in another category. Where necessary, competencies were re-phrased, split further, merged or deleted. Eighty discrete and non-overlapping competencies remained after this process.

4. Recategorisation

Once a clean set of competencies was produced, all items were re-scrutinised for category fit. This process highlighted significant overlap between some categories and their associated items. For example, the items within 'Knowledge synthesis and evaluation' and 'Research / knowledge creation' all reflected the process of building and harnessing research knowledge ahead of onward brokerage, and could not viably be separated. Thus these categories were conjoined into 'Creating, sourcing and synthesising (research) knowledge' to reflect the process of producing (creating), looking for (sourcing), and combining (synthesising) research for impact. Similarly, 'Managing partnerships / relationships', 'Networking', and 'Stakeholder engagement' covered many of the same relationship-building and management skills. A more viable division reflected the chronology of these processes, with the skills of seeking and establishing relationships set in contrast to those needed to maintain them. As a result of this review process, the original category list was reduced to a more comprehensive set of 11 competency groups (see Table 2 for changes and Table 3 for category descriptions). All 80 competencies were retained.

Table 2: Revision of original categories to final category list

Original categories (N=17)	Final categories (N=11)
Change management	Change management
Communicating	Communication
Knowledge evaluation and synthesis	Creating, sourcing and synthesising (research) knowledge
Research/knowledge creation	
Evaluation of KT / impact	Evaluating impact of KT
Facilitation	Facilitating and negotiating
Negotiating	
Leadership	Leading, managing and driving KT
Project management	
Intellectual property (IP)	Managing legal issues and IP
Managing legal issues	
Managing partnerships / relationships	Managing partnerships / relationships
Networking	Networking and engaging stakeholders
Stakeholder engagement	
Capacity building	Training and capacity building
Creating and Using KT tools, products and practices	Understanding, creating and using KT tools, products and practices
Understanding KT models / theories	

Table 3: Competency categories and descriptions

Competency category	Skills related to:
Change management	Creating and managing (organisational / culture) change, shifting conditions from a baseline to goal state
Communication	Communicating with a range of stakeholders, both internally and externally, individually and in teams
Creating, sourcing and synthesising (research) knowledge	Development, discovery and consolidation of research knowledge to be mobilised
Evaluating impact of Kmb	Measurement, tracking and recording of the effects (impact) of Kmb
Facilitating and negotiating	Facilitating, liaising, negotiating the translation of research into adoption and impact
Leading, managing and driving KT	Strategic oversight, management and leadership of processes for knowledge mobilisation
Managing legal issues and intellectual property	Legal governance, legal processes and intellectual property management
Managing partnerships / relationships	Maintaining partnerships and sustaining relationships with engaged external / internal stakeholders
Networking and engaging internal / external stakeholders	Establishing new partnerships and building connections
Training and capacity building	Supporting the development of Kmb skills and understanding, improving individual and organisational competency
Understanding, creating and using Kmb tools, products and practices	Identification, assessment and integration of Kmb best practice and theory / evidence-based tools

Production of final competency framework

A final review of the 80 retained items in 11 categories was undertaken by the team to ensure exclusivity of competencies, action-based phrasing and correct categorisation. Minor phraseology changes were made but otherwise competencies, categories and the alignment of the two were unchanged. The final competency framework is provided in Table 4.

Table 4: Final knowledge mobilisation competency framework

Category	Competency
Change management	Change management knowledge and application
	Supporting change culture: using communication skills to support a culture of change
	Quality control of change processes
	Advocating change: strongly advocating for change across the organisation
	Customer focus: ensuring that the change services the needs of the organisation and its individuals
	Quality improvement: supporting spread of improvement
Communication	Internal communication skills: communicating successfully within and beyond the institution
	External communication skills: communicating successfully beyond the institution
	Reporting and presenting knowledge
	Simplifying and translating: Summarising complex information and communicating key issues
	Marketing and promotion: building profile both within and beyond the organisation
	Feedback skills: producing constructive feedback and analysis tailored to multiple audiences
	Active listening: ensuring your response is tailored to the other
	Media engagement skills
Creating, sourcing and synthesising (research) knowledge	Research knowledge assessment and management: Combining, organising and summarising relevant knowledge
	Sourcing research, solutions and contacts
	Scans and leverages information collected by others, of priorities, issues, trends and concerns
	Horizon scanning: exploring novel and unexpected issues as well as persistent problems or trends
	Using data and measures from practice to inform strategy
	Capturing tacit knowledge
	Identifying or facilitating the identification of quality evidence
	Creating new research knowledge
	Evaluating research knowledge

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Evaluating impact of KT	Evaluating impact of KMb / KT strategies and approaches
	Planning impact pathways
	Identifying, monitoring and capturing indicators of impact
	Identifying and capturing impact evidence from external sources (including partners)
Facilitating and negotiating	Facilitation skills: nurturing discussions, spaces, and activities in the support of change
	Facilitating sharing of knowledge
	Facilitating the consultation between key stakeholders to support the contextualisation, interpretation and translation of quality evidence
	Questioning: asking the right questions in the right way to facilitate
	Negotiation skills
Leading, managing and driving KT	Agenda setting: influencing change topics and activities
	Leadership, supervision and strategic oversight
	Fostering innovation
	Ideas generation: providing options for ways forward
	Influencing senior managers and decision makers
	Coordinating knowledge broker network processes
	KMb / KT project management and leadership
Managing legal issues and IP	Licensing and patents
	Conducting valuations of technologies / business / IP
	Intellectual property skills and management
	Acknowledging authors, originators, and contributors to any and all resources made available in the public domain
	Supporting and managing technology / knowledge exploitation
	Commercialisation techniques: skills and knowledge in commercialising research
	Setting up or supporting spin-off / start-up businesses
	Managing legal issues related to knowledge translation
	Conducting deals and decision making in legal and commercial activities
Managing partnerships and relationships	Stakeholder communications: coordinating regular communications to link groups with information relevant to their current topic(s) of interest
	Developing and maintaining professional relationships
	Transitioning between teams: seamlessly shifting between multiple teams to support achievement of change
	Partnership and relationship management skills and processes
	Working in teams, communities and networks
	Managing multiple conversations: applying communication skills to multiple concurrent conversations with multiple actors

Category	Competency
Networking and engaging stakeholders	Networking: making contacts with the (right) people and facilitating contacts for others
	Organisational link: acting as a connection point to your organisation
	Building contacts and resources to support change
	Fostering partnerships between professionals, organisations and sectors
	Identifying or responding to the identification of opportunities to assemble groups (that is, communities of practice or special interest groups)
	Finding and engaging with non-academic partners
	Interfacing with government
	Linking decision makers, researchers, and users with each other
	Identifying stakeholder knowledge needs
	Coaching / mentoring / counselling / buddying: providing 1:1 support where necessary
Training and capacity building	Devising training: personal development opportunities and training programmes for KMb / KT / knowledge-into-action (KTA)
	Delivering training programmes to develop workforce capabilities in KMb / KT / knowledge-into-action
	Building decision-making capabilities: sharing information with stakeholders about KMb / KT practices in order to build capacity for evidence-informed decision making
	Mobilising advocates across multiple audiences to engage / inspire others
	Project and programme planning: developing KMb / KT plans for research projects and programmes
Understanding, creating and using KT tools, products and practices	Practical application of KMb / KT tools, techniques and frameworks
	Sector-specific application: applying knowledge to improve processes and outcomes in a specific field
	Defining actionable knowledge solutions
	Problem solving: drawing on personal / professional experiences to facilitate solutions
	Designing quality evidence based products (for example, visual representations) to develop KMb / KT expertise and enhance effectiveness of communication
	Collaborative technology: understanding, developing, using and maintaining web-based collaborative technology (for example, social media) to ensure the accessibility of quality evidence
	Helping groups to identify KMb / KT facilitation strategies by using relevant knowledge about KMb / KT frameworks, theories, models, mechanisms and strategies
	Supporting accessibility of quality evidence through the design and development of products, learning series and resource collections
	Supporting adoption: improving the uptake, adoption and use of information and knowledge
	Knowledge of KMb / KT models / theories
	Knowledge of KMb / KT strategies

Discussion

This paper provides the first comprehensive synthesised framework for professional competencies in non-commercial research impact and knowledge mobilisation. Establishing this coherent set of skills is the first step in underscoring better human resource management and professional development in KMb and impact-related skills for academic and non-academic staff. This framework also helps elucidate the extent of effort and skill utilisation needed to mobilise research knowledge into effect.

This framework contributes to the sector shift away from knowledge transfer as a linear and commercially focused activity, and towards a broader and more comprehensive set of proficiency standards. The 80 competencies within 11 categories reflect the diverse range of skills required to effectively mobilise knowledge, and thus reinforce the need for a function rather than role-specific focused approach to professional development. The framework presented here does not reflect an expectation that all skills are required; instead this framework offers a structure from which both individuals and institutions (including research, intermediary and practice or policy organisations) can identify and select skills relevant to specific research impact practitioner profiles. This framework similarly helps shift away from the linear logic assumptions of stepwise impact models which do not easily represent the complex and iterative nature of research use (Nutley et al, 2007). For research to be meaningfully translated, the skills of those in the position to do so must be acknowledged and reinforced. Accordingly, strategic discussions on *competencies* must be underscored by parallel consideration of *competence* and how the translation of research evidence into practice or policy can be fortified by focused, specialised effort.

Methodological commentary

There are arguably multiple ways to configure such a broad set of competencies. For example, ‘quality control of change processes’ was first categorised under an early ‘quality’ category. However, this category was dropped before the initial (n=17) list as it was deemed to be an overarching aim rather than a competency category itself. Thus, through a process of iterative review, this competency was aligned instead to ‘Change management’, reflecting this as a core function of KMb. Similarly, the nuance of wording – which became so integral to the process of refinement and categorisation – could be easily adjusted to provide a slightly different structure. However, the intense process of iterative review undertaken suggests that the framework as presented reflects a justifiable, applicable, timely and clear summary of skills for non-commercial KMb.

Conclusions and implications

This competency framework for non-commercial knowledge mobilisation and research impact offers benefits for both institutions seeking to recruit, train and retain research impact practitioners, and for individuals seeking to assess and develop their own skills. For the latter, the framework offers a means to develop a clearer and enhanced professional and academic identity and develop critical skills in an increasingly professionalised domain. For both institutions and practitioners/researchers, a well-defined competency framework helps to undercut the difficulties associated with unstandardised job titles and unclear cross-professional skills.

Creating the competency framework enables three distinct but related avenues for future work. Firstly, the extent to which these competencies are core or specialised must be explored within the KMB profession – and across international boundaries – to establish commonalities of competencies in practice. To this end, the research team has already initiated a cross-national survey to establish patterns in competencies and how they may vary by country, level of post and main remit of post. Secondly, the framework must be aligned with pre-existing and validated competency sets, such as the Great Eight (Bartram, 2005). The Great Eight – with its focus on generic competencies (for example, ‘Leading and deciding’) – provides a complementary categorisation which will reinforce efforts to implement the framework in practice. Having established clarity in KMB-specific and broader *competencies*, the third step is then the development of a tool to self-assess *competence* – that is, how able an individual is to perform that skill or competency. These elements combined with impact literacy (Bayley and Phipps, forthcoming) will support the enhancement of skills and knowledge necessary to generate impact and optimally translate research into meaningful social benefit.

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