Development of a framework for knowledge mobilisation and impact competencies

Bayley, J, Phipps, D, Batac, M & Stevens, E

Development of a framework for knowledge mobilisation and impact competencies

Authors:

Julie Elizabeth Bayley, Coventry University, UK

David Phipps, York University, Toronto, Canada

Monica Batac, Ryerson University, Toronto, Canada

Ed Stevens, University of Bath, UK

Corresponding author:

Julie Bayley

Faculty of Health and Life Sciences

Coventry University

CV1 5FB

Email: j.bayley@coventry.ac.uk

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. The dual-funding process in the UK (see (Hughes, Kitson, Bullock, & Milner, 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 (Watermeyer, 2012). 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 (HEFCE), 2011). Similarly, competitive Research Councils grants schemes require strong 'Pathways to Impact' statements (see http://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, http://www.sshrc-crsh.gc.ca), knowledge translation (in health, http://www.cihr-irsc.gc.ca) and commercialisation (natural sciences and engineering, http://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, & 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

(http://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 commercialization, KMb practice is far less uni-directional and reflects a more socially engaged process (Greenhalgh & Wieringa, 2011) Research that can inform public policy, professional practice or social services often requires more iterative, multi-perspective and multi-partner efforts (Lang & Hardwick, 2016; Phipps et al, 2016).

An assessment driven paradigm (i.e. REF) which is retrospectively focused on existing research impacts can mask the skills required to broker research knowledge and collaborations to generate future impacts. Despite a range of frameworks for both impact and knowledge mobilisation (eg. Co-produced pathway to impact, Phipps et al, 2016; CAHS Research Impact Assessment Framework, Frank & Nason, 2009; Payback Framework, (Buxton & Hanney, 1996) there remains a gap in understanding the specific competencies needed to successfully translate research into practice. Brokering research knowledge into social practice is a highly effortful and complex activity; without sufficient focus on skills, both institutions and individuals may be underequipped to deliver effective KMb. 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, 2014). Research institutions are investing in staff who 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 of derived from academic research. Such roles have been described at the University of Edinburgh (Knight & 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 imaginative, intuitive, an 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 & 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 (i.e. skills as opposed to personal characteristics) required.

Identifying and then building these competencies is complicated by a number of factors. Firstly, the diffusion of functions across dedicated brokers, impact-focused research managers and academics dilutes the professional identity of those working in this area. Secondly, as a result there is little consensus on job titles, extensive variation in expectations and limited coherence of career pathways. Thirdly, with a diverse and unstandardized vocabulary to describe the nature of KMb activity, it is hard to build a taxonomy of KMb functions and their effectiveness/ appropriateness of application. Finally, with insufficient understanding of the skills required by research impact practitioners (including academic researchers generating impact as a function of their research), recruitment and professional development practices are weakened. For research impact practitioners to perform effectively, they must be (i) impact literate (Bayley & Phipps, 2016) – i.e. they understand how research leads to effect, (ii) competent in the appropriate skills and (iii) able to apply these effectively in practice and in changeable contexts. A "know-do gap" exists if literacy ("knowing") is not informed by

competencies ("doing") and vice versa. Impact literacy alone is insufficient for the generation of effects, and skills without underlying comprehension are likely to produce diluted impact or missed opportunities. Enabling, supporting and facilitating research impact requires that these 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 knowledge mobilisation practitioners (including self-identified researchers, public engagement officers, knowledge brokers and librarians) began a discussion on human resources for knowledge mobilisation. 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 build 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 pre-requisite 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 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. Frameworks focusing on commercialization competency frameworks alone were excluded. IP related competencies in identified frameworks were ultimately retained; however, competency frameworks based solely on commercialization were not included in the review. 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 & 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 were synthesised into a single list through four sequential stages:

i. **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, eg.*"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, synthesized 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.

ii. **Provisional categorisation**

Next, these 94 competencies were thematically grouped into provisional higher-order categories 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". This iterative process resulted in 17 competency categories:

       1. Change management

       2. Communicating

       3. Knowledge evaluation and synthesis

       4. Research/knowledge creation

5. Evaluation of KT/impact

6. Facilitation

7. Negotiating

8. Leadership

9. Project management

10. Intellectual property (IP)

11. Managing Legal issues

12. Managing partnerships/relationships

13. Networking

14. Stakeholder engagement

15. Capacity building

16. Creating and Using KT tools, products and practices

17. Understanding KT models/theories

iii. Cleaning

Thirdly, all competencies were reviewed again within their assigned categories to ensure they were (i) a discrete competency within that category, (ii) actively phrased to reflect the performance of a skill and (iii) not duplicated in another category. Where necessary, competencies were rephrased, split further, merged or deleted. 80 discrete and non-overlapping competencies remained after this process.

iv. 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 early production and assessment of the research itself.

Similarly, *'Managing partnerships/relationships', 'Networking'* and *'Stakeholder*

engagement' covered many of the same relationships 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 eleven 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)
1. Change management	A. Change management
2. Communicating	B. Communication
3. Knowledge evaluation and synthesis	C. Creating, sourcing and synthesising (research) knowledge
4. Research/knowledge creation	
5. Evaluation of KT/impact	D. Evaluating impact of KT
6. Facilitation	E. Facilitating and negotiating
7. Negotiating	
8. Leadership	F. Leading, managing and driving KT
9. Project management	
10. Intellectual property (IP)	G. Managing legal issues and IP
11. Managing Legal issues	
12. Managing partnerships/relationships	H. Managing partnerships / relationships
13. Networking	I. Networking and engaging stakeholders
14. Stakeholder engagement	
15. Capacity building	J. Training and capacity building
16. Creating and Using KT tools, products and practices	K. Understanding, creating and using KT tools, products and practices
17. Understanding KT models/theories	

Table 3: Competency categories and descriptions

Competency category	Description
A. Change Management	Skills related to creating and managing (organisational / culture) change, shifting conditions from a baseline to goal state
B. Communication	Skills related to communicating with a range of stakeholders, both internally and externally, individually and in teams
C. Creating, sourcing and synthesising (research) knowledge	Skills associated with the development, discovery and consolidation of research knowledge to be mobilised
D. Evaluating impact of KMb	Skills focused on the measurement, tracking and recording of the effects (impact) of KMb
E. Facilitating and negotiating	Skills related to facilitating, liaising, negotiating the translation of research into adoption and impact
F. Leading, managing and driving KT	Skills relating to strategic oversight, management and leadership of processes for knowledge mobilisation
G. Managing legal issues and IP	Skills related to legal governance, legal processes and intellectual property management
H. Managing partnerships / relationships	Skills related to maintaining partnerships and sustaining relationships with engaged external / internal stakeholders
I. Networking and engaging internal / external stakeholders	Skills related to establishing new partnerships and building connections
J. Training and capacity building	Skills related to supporting the development of KMb skills and understanding, improving individual and organisational competency
K. Understanding, creating and using KMb tools, products and practices	Skills related to the identification, assessment and integration of KMb best practice and theory/ evidence based tools

Production of final competency set

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 set is provided in table 4.

Table 4: Final knowledge mobilisation competency set

Category	Competency
A. Change management	1. Change management knowledge and application
	2. Supporting change culture: using communication skills to support a culture of change
	3. Quality control of change processes
	4. Advocating change: strongly advocating for change across the organisation
	5. Customer focus: ensuring that the change services the needs of the organisation and its individuals
	6. Quality improvement: supporting spread of improvement
B. Communication	7. Internal communication skills: communicating successfully within and beyond the institution.
	8. External communication skills: communicating successfully beyond the institution.
	9. Reporting and presenting knowledge
	10. Simplifying and translating: Summarizing complex information and communicating key issues
	11. Marketing and promotion: building profile both within and beyond the organisation
	12. Feedback skills: producing constructive feedback and analysis tailored to multiple audiences
	13. Active listening: ensuring your response is tailored to the other
	14. Media engagement skills
C. Creating, sourcing and synthesising (research) knowledge	15. Research knowledge assessment and management: Combining, organizing and summarizing relevant knowledge
	16. Sourcing research, solutions and contacts
	17. Scans and leverages information collected by others, of priorities, issues, trends and concerns
	18. Horizon scanning: exploring novel and unexpected issues as well as persistent problems or trends
	19. Using data and measures from practice to inform strategy
	20. Capturing tacit knowledge
	21. Identifying or facilitating the identification of quality evidence
	22. Creating new research knowledge
	23. Evaluating research knowledge
D. Evaluating impact of KT	24. Evaluating impact of Knowledge Mobilization/KT strategies and approaches
	25. Planning impact pathways
	26. Identifying, monitoring and capturing indicators of impact
	27. Identifying and capturing impact evidence from external sources (including partners)
E. Facilitating and negotiating	28. Facilitation skills: nurturing discussions, spaces, and activities in the support of change
	29. Facilitating sharing of knowledge
	30. Facilitating the consultation between key stakeholders to support the contextualization, interpretation and translation of quality evidence

Category	Competency
	31. Questioning: asking the right questions in the right way to facilitate
	32. Negotiation skills
F. Leading, managing and driving KT	33. Agenda setting: influencing change topics and activities
	34. Leadership, supervision and strategic oversight
	35. Fostering innovation
	36. Ideas generation: providing options for ways forward
	37. Influencing senior managers and decision makers
	38. Coordinating knowledge broker network processes
	39. KMb/KT project management and leadership
G. Managing legal issues and IP	40. Licensing and patents
	41. Conducting valuations of technologies/business/IP
	42. Intellectual property skills and management
	43. Acknowledging authors, originators, and contributors to any and all resources made available in the public domain
	44. Supporting and managing technology/knowledge exploitation
	45. Commercialization techniques: skills and knowledge in commercializing research
	46. Setting up or supporting spin off / start-up businesses
	47. Managing legal issues related to knowledge translation
	48. Conducting deals and decision making in legal and commercial activities
H. Managing partnerships and relationships	49. Stakeholder communications: coordinating regular communications to link groups with information relevant to their current topic(s) of interest
	50. Developing and maintaining professional relationships
	51. Transitioning between teams: seamlessly shifting between multiple teams to support achievement of change
	52. Partnership and relationship management skills and processes
	53. Working in teams, communities and networks
	54. Managing multiple conversations: applying communication skills to multiple concurrent conversations with multiple actors
I. Networking and engaging stakeholders	55. Networking: making contacts with the (right) people and facilitating contacts for others
	56. Organizational link: acting as a connection point to your organisation
	57. Building contacts and resources to support change
	58. Fostering partnerships between professionals, organizations and sectors
	59. Identifying or responding to the identification of opportunities to assemble groups (i.e. Communities of Practice or Special Interest Groups)
	60. Finding and engaging with non-academic partners
	61. Interfacing with government
	62. Linking decision makers, researchers, and users with each other
	63. Identifying stakeholder knowledge needs
J. Training and capacity building	64. Coaching / mentoring / counselling / buddying: providing 1-1 support where necessary

Category	Competency
	65. Devising training: personal development opportunities and training programmes for KMb / KT / knowledge-into-action (KTA)
	66. Delivering training programs to develop workforce capabilities in KMb / KT / knowledge-into-action (KTA)
	67. Building decision making capabilities: sharing information with stakeholders about KMb/KT practices in order to build capacity for evidence-informed decision making
	68. Mobilizing advocates across multiple audiences to engage/inspire others
K. Understanding, creating and using KT tools, products and practices	69. Project and program planning: developing KMb/KT plans for research projects and programs
	70. Practical application of KMb/KT tools, techniques and frameworks
	71. Sector specific application: applying knowledge to improve processes and outcomes in a specific field
	72. Defining actionable knowledge solutions
	73. Problem solving: drawing on personal / professional experiences to facilitate solutions
	74. Designing quality evidence based products (e.g. Visual representations) to develop KMb/KT expertise and enhance effectiveness of communication
	75. Collaborative technology: understanding, developing, using and maintaining web-based collaborative technology (e.g. social media) to ensure the accessibility of quality evidence
	76. Helping groups to identify KMb/KT facilitation strategies by using relevant knowledge about KMb/KT frameworks, theories, models, mechanisms and strategies
	77. Supporting accessibility of quality evidence through the design and development of products, learning series and resource collections
	78. Supporting adoption: improving the uptake, adoption and use of information and knowledge
	79. Knowledge of KMb/KT models / theories
	80. 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 institutions and individuals can identify and select skills relevant to specific research impact practitioner profiles. This framework similarly helps shift away the linear logic assumptions of stepwise impact models which do not easily represent the complex and iterative nature of research use (Nutley, Walter, and Davies, 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 unstandardized 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 have 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 (e.g. 'Leading and deciding') – provides a complimentary 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* – i.e. how able an individual is to perform that skill or competency. These elements combined with impact literacy (Bayley & Phipps, 2016) will support the enhancement of skills and knowledge necessary to generate impact and optimally translate research into meaningful social benefit.

References

Bartram, D, 2005, The Great Eight Competencies: A Criterion-Centric Approach to Validation, *Journal of Applied Psychology* 90, 6, 1185–1203.

Barwick, M, 2014, *Building Capacity for Knowledge Translation Practitioners in Canada*. Unpublished paper obtained via personal communication.

Bayley, J and Phipps, DJ, 2016, *Research Impact Literacy*. Paper presented at the Canadian Knowledge Mobilization Forum. Toronto, Canada. June 29, 2016.

Buxton, M, and Hanney, S, 1996, How can payback from health services research be assessed? *Journal of Health Services Research 1*, 1, 35-43.

Higher Education Funding Council for England (HEFCE), 2011, Decisions on assessing research impact: HEFCE.

Hughes, A, Kitson, M, Bullock, A, and Milner, I, 2013, *The dual funding structure for research in the UK: Research Council and Funding Council Allocation methods and the pathways to impact of UK academics,* Department of Innovation and Skills, UK Innovation Research Centre, Cambridge.

Lang, IA, and Hardwick, R, 2016, Knowledge, knowledge mobilisation and the third sector, *Evidence & Policy 7,* 2, 209-218.

Lomas, J, 2007, 'The in-between world of knowledge brokering', *British Medical Journal 334*, 7585, 129–32.

NHS Scotland, 2012, *A capability framework for NHS Scotland's Knowledge Broker Network: Working together to translate knowledge into action to improve Scotland's Health and Care*. http://www.knowledge.scot.nhs.uk/media/CLT/ResourceUploads/4064222/20121008%20Capability%20Framework%20forthe%20Knowledge%20Broker%20Networkv2.pdf

Nutley, SM, Walter, I, and Davies, HTW, 2007, *Using Evidence: How research can inform public services,* Bristol, Policy Press.

Phipps, DJ, and Morton, S, 2013, Skills and qualities of knowledge brokers: reflections from practice, *Evidence & Policy, 9,* 2, 255-65.

Phipps, DJ, Cummings, J, Pepler, D, Craig, W, and Cardinal, S, 2016, The Co-Produced Pathway to Impact describes Knowledge Mobilization Processes, *Journal of Community Engagement and Scholarship, 9*, 1, 31-40.

Stetler, CB, Damschroder, LJ, Helfrich, CD, and Hagedorn, HJ, 2011, A guide for applying a revised version of the PARIHS framework for implementation, *Implementation Science, 6*, 99, www.implementationscience.com/content/6/1/99.

Stevens, E, 2015, *Change Agency & Public Engagement*, unpublished report obtained via personal communication.

Ward, VL, House, AO, and Hamer, S, 2009a, Developing a framework for transferring knowledge into action: a thematic analysis of the literature, *Journal of Health Services Research and Policy 14,* 3, 156-164.

Ward, V, House, A, and Hamer, S, 2009b, 'Knowledge brokering: the missing link in the evidence to action chain', *Evidence & Policy 5,* 3, 267–79.

Watermeyer, R, 2012, From engagement to impact? Articulating the public value of academic research, *Tertiary Education and Management 18,* 2, 115-130.

Watermeyer, R, 2014, Issues in the articulation of 'impact': the responses of UK academics to 'impact' as a new measure of research assessment, *Studies in Higher Education 39*, 2, 359-377.