

MPC MAJOR RESEARCH PAPER

EXPLORING THE FIELD AND PRACTICE OF
KNOWLEDGE MOBILIZATION: IDENTIFYING COMMON APPROACHES AND
PRIORITY COMPETENCIES USING Q-METHODOLOGY

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Author's Declaration

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Abstract

With the growing interest to understand knowledge mobilization (KMb) and knowledge brokering in practice, this Major Research Paper investigates the viewpoints of knowledge mobilization experts, researchers, intermediaries, and practitioners regarding priority KMb activities, and the competencies and skills required for such tasks. This mixed methods study employed Q-Methodology, with data collected in two major phases. First, expert interviews were conducted with 20 KMb experts from Canada and the UK to develop the study's concourse and subsequent q-statements. Second, 91 participants completed an online Q-survey, with a Q-sort task with 49 q-statements and an activity-rating task with 31 activities. Respondents also answered a range of open-ended questions pertaining to their KMb work, training, and perspectives. A crucial component of this research is the use of the Great Eight Competencies Framework, also known as the Universal Competencies Framework (UCF). Analysis identified four distinct approaches to KMb and puts forward a preliminary hierarchy of KMb competencies, according to the survey responses. The proposed hierarchy advances current understandings of KMb in demonstrating commonalities in competencies across various professions and fields. KMb practitioners and researchers are encouraged to respond and refine this initial list of priority competencies according to their workplace and/or research contexts.

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Dedication

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Introduction

Over the past 50 years, terms and practices involving the production, utility, and dissemination of research, or knowledge have proliferated. Contemporary names include research utilization, knowledge mobilization (KMb), knowledge translation, knowledge transfer, knowledge exchange, implementation science, among others (Estabrooks et al., 2008; Graham et al., 2006; Graham, Tetroe, & the KT Theories Research Group, 2007; Ward, House and Hamer, 2009a). Broadly, KMb can be understood as an umbrella term describing the interaction between research evidence or various forms of knowledge, policy, and practice (Davies, Nutley, & Smith, 2000a, 2000b; Nutley, Walter, & Davies, 2007). The growing awareness of KMb has established the importance of this work, despite the challenges in understanding how it should be done. For instance, it can take over a decade to learn about “what works” in healthcare interventions before widespread promotion, implementation, and practice take place (Nutley & Davies, 2000).

Healthcare, too, has well-developed approaches to and understandings of using research evidence to inform practice and policy. Other professions and fields – for example, education – are still “grappl[ing] with what it means to be evidence-based” (Nutley & Davies, 2000, p. 317).

Certainly, there is an increasing need to find out what specific interventions as well as organizational and system structures are more effective in promoting the use of research evidence (Belkhodja, Amara, Landry & Ouimet 2007; Davies et al. 2000a, 2000b; Nutley et al., 2007). It is equally imperative to look at the individuals working on KMb within projects, organizations, and systems. As Belkhodja, Amara, Landry, and Ouimet (2007) maintain, “We cannot understand how an organization functions if we do not understand how the people who make it up function” (p. 380). While many professions, fields, and disciplines emphasize KMb, or the application and use of research, there is still much to learn about what key skills and

competencies are required to engage in this kind of work. This exploratory study seeks to learn more about the individuals engaged and immersed in KMb work. Many current KMb intermediaries, brokers, and practitioners are not professionally trained for this work; they learn skills “on the job” and desire more support and education (Barwick, Bovaird, McMillen, in press). This study seeks to illustrate common approaches within the diversity of KMb practice and perspectives by uncovering opinions on priority KMb activities, and the primary skills and competencies for such tasks.

Literature Review

The various definitions of knowledge mobilization

When tracing the history of the term *knowledge mobilization* (KMb), many first point to *research utilization* as discussed by Weiss (1979). Covering the major academic disciplines, Weiss proposes seven models, or ways of understanding the utilization of research. While her original concern was with the application of research for policy, the models can be used to describe research utilization for any purpose. More recently, in tracing the history of research utilization via bibliometrics, Estabrooks et al. (2008) illustrate the complex and convoluted ways this work is described. Researchers employ a wide variety of terms for ‘research utilization’ and ‘dissemination.’ Often, these terms, among others, are used interchangeably and erroneously. Similarly, Graham et al. (2006), Graham, Tetroe, and the KT Theories Research Group (2007), and Ward, House, and Hamer (2009a) illustrate the problematic practice of engaging in a variety of terms across the disciplines. Such fracturing is confusing to both theorists and practitioners alike, complicating the process in understanding and situating further developments in theory and practice. For instance, Ward and colleagues identified 58 different terms employed across a broad range of disciplines, and found 28 various models that illustrate part or all of a process for transferring knowledge into action. Graham et al. (2006) found 29 terms used by funding agencies for applied research.

The practice of KMb – variety and debate

Beyond the surface level of multiplicity in terminology, there is a fractured and divisive understanding of what it means to use, act upon, or uptake research (Dunn, Dukes, and Cahill, 1984; Landry, Amara, & Lamari, 2001a, 2001b; Lomas, 1993; Seidel, 1981). These three verbs alone – use, act upon, and uptake - already hint at the range in approaches to KMb. For instance,

Lomas (1993) makes semantic distinctions between diffusion, dissemination, and implementation. He notes the existing differences and nuances with each term, arguing, “Diffusion, dissemination, and implementation are not interchangeable terms; they are phases in a process of increasingly active and more focused intents, with each subsequent phase dependent on the success of its predecessor phase” (p. 227). However, others do not understand it as a sequential process. Belkhodja et al. (2007) argue that the mainstream models of push, pull, dissemination, and interaction (p. 382-383) do not fully capture the complex determinants and factors affecting knowledge utilization. Nutley et al. (2007) argue that research can be used in instrumental, conceptual, strategic/tactical, and process-oriented ways (p. 37-38) – and even within and across these broad typologies, there is massive diversity and debate. Furthermore, what constitutes “research evidence” often does not account for various forms of knowledge, including practitioner or expert knowledge. Abreu, Grinevich, Hughes, and Kitson (2009) agree that there is a lack of awareness and recognition of practitioner knowledge and expertise, alongside the ongoing negotiation of knowledge for practice use: “There is an incomplete representation of the wide process of knowledge exchange that takes place between academics from all disciplines with partners in the private, public, and so-called third sector” (p. 7). While we know much about research production and research use, we know very little about the mediation, the middle space, and intermediary processes between the two (Levin, 2013). And even then, in examining intermediary organizations (specifically, research brokering organizations in education), Cooper (2014) found eight distinct brokering functions, illustrating the range within just one domain of Levin’s model, including “linkage and partnerships, awareness, accessibility, engagement, capacity building, implementation support, organizational development and policy influence” (p. 47).

Using Q-Methodology, the research approach used for this study (to be discussed later), Sharifi, Liu, and Ismail (2014) demonstrate the range and diversity in KMb perspectives among university-based senior managers in the United Kingdom (UK). It is important to note that Sharifi and colleagues use *knowledge transfer* to describe technology transfer and commercialization (TT/C), although others use knowledge transfer to describe processes and practices beyond these two domains (and actually, often excluding the technological and commercial components). Indeed, there are debates regarding the relevance and connection between TT/C and KMb (Abreu et al. 2009; Barwick et al., 2014; Hughes, Kitson, Probert, Bullock, & Milner, 2011; Schartinger, Rammer, Fischer, & Fröhlich, 2002). Nonetheless, Sharifi and colleagues illustrate the diversity in how this debatable subset of KMb is understood. For example, some promote an open system and structure for KMb/knowledge transfer innovation, network growth, and collaboration; others demarcate the knowledge transfer role and what tasks fall under the knowledge transfer office's responsibility. Their Q-study illustrates at least four distinct viewpoints regarding knowledge transfer and how it works. The opinions of these senior managers expose both shared and contrasting work and institutional priorities, among individuals holding comparable roles within the specific context of the UK university. For some, the top priority is having role and organizational "openness" for building collaborations and connections, while others give primary importance to performance evaluation and accountability (as indicated by effectiveness and efficiency). A third group of managers focused on building capacity within the university, while a fourth group prioritized "reconciliation" or brokering between various partners and stakeholders. This contrasts what Barwick, Phipps, Myers, Johnny, and Coriandoli (2014) found in the Canadian context. Barwick and colleagues considered technology transfer and commercialization as part of KMb/knowledge translation; however, they

found that Canadian practitioners view and operate in TT/C distinctly and separately from KMb. In the UK, however, the hybridity and diversity are arguably accepted and acknowledged (Lightowler and Knight, 2013).

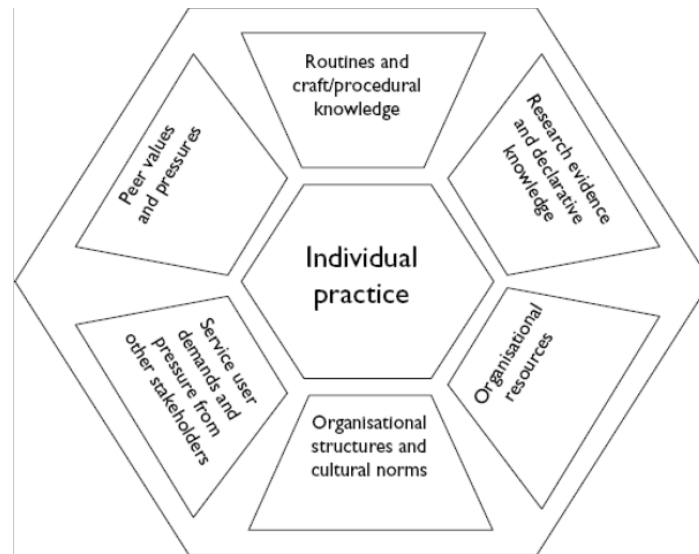
Another study investigating viewpoints on knowledge mobilization is Lindsey's work on barriers to knowledge sharing (2003a, 2003b). Approaching KMb as *knowledge management* (KM), the participants in Lindsey's Q-study were knowledge workers within a single organization. Employing Gross' definition of knowledge worker, "anyone whose work involves tasks that require the processing of information" (Gross qtd. in Lindsey, 2003b, p. 2), Lindsey acknowledges that various understandings and definitions of KM exist (p. 3). Lindsey utilized a communication model that frames knowledge sharing as two-way communication (p. 9-10); indeed, one might argue that Lindsey oversimplifies the processes and relationships at play. However, Lindsey's definition of knowledge reflects an action-oriented understanding, much in line and spirit with KMb: "Knowledge is the potential for action. More specifically, knowledge is the necessary element required to inform individuals when action is required, motivate individuals to take action, or provide a plan for action" (p. 6). Further, he illustrates the complexity in asking knowledge workers for their viewpoints. He writes that he

acknowledges the fact that many decisions are made on a subconscious level, and that there is no surety that knowledge workers always act rationally. In addition, even when knowledge workers understand why they act, they may not be able to explain their actions to researchers, and thus their perceptions must be used as a proxy. (p. 17-18)

Thus, there exists a challenge in describing KMb work. Recently, Landry et al. (2001b), Nutley et al. (2007), and others have attempted to illustrate the range of KMb practices and perspectives in specific professions and disciplines. Exploring academics' perspectives and practices within the social sciences, Cherney, Head, Boreham, Povey, and Ferguson (2013) maintain that very little is known about "disciplinary variations in research translation and uptake" (p. 782).

Furthermore, there is little known about those who facilitate and support this work. With Nutley and Davies' (2000) illustration of the wide range of influences in individual practice (see Figure 1), we can see the challenge in deciphering the work of a KMb practitioner.

Figure 1: Broad influences on practice



Reproduced from Nutley and Davies, 2000, p. 337

KMb practitioners

Given the different, diverse, and perhaps debatable ways research can be used, this study seeks to learn more about the experiences of those working in KMb across a variety of contexts and professions. Several studies begin to illustrate the complexity and diversity of KMb work, mirroring the fractured theoretical and operational definitions demonstrated in the literature. With the development of roles and positions within organizations and institutions for this work comes the emergence of training and education programs for KMb (Barwick, Bovair & McMillen, in press; Barwick et al., 2014; Kho, Estey, DeForge, Mak, and Bell, 2009; Padek et al., 2015; Stamatakis, Norton, Stirman, Melwin, and Brownson, 2013; Straus et al., 2011). In studying the characteristics of various research groups in the UK, Olmos-Peñuela, Castro-

Martínez and D'Este (2014) demonstrate that it is increasingly important to focus on the individuals who drive knowledge transfer direction and activities. There is much to be learned about who holds these positions – in particular, specificity about their roles, tasks, and responsibilities, and what competencies and skills are required for such work.

Similar to the wide range in KMb's high-level definitions and terminology, there are comparably diverse ways to describe and define individual KMb roles and job titles within various organizational, work, implementation, and mediation contexts (Ward et al., 2009b). Knight and Lightowler (2010) emphasize that both ambiguity and hybridity exist around this work. Lomas (1993) argues that the diversity of the KMb field requires distinct roles (p. 232). Meanwhile, Knight and Lightowler (2010) and Whitchurch (2008, 2009a, 2009b) recognize that many professionals do KMb tasks in addition to their main priorities. Indeed, there is a lack of clarity in how exactly KMb is employed in practice, and by whom.

Within the research and professional practice of KMb, the knowledge broker, or intermediary role has emerged (Lomas, 2007; Meyer, 2010; Meyer and Kearnes, 2013; Oldham and McLean, 1997; Schlierf and Meyer, 2013; Ward et al., 2009b). To add to this, others have also been exploring KMb skills and competencies for academics (for instance, see Bicknell, Francis-Smythe and Arthur, 2010; Francis-Smythe and Haase, 2006). In discussing the development of the knowledge broker role, Meyer (2010) illustrates the great variance in how this role appears and operates in various contexts. For instance, he distinguishes between knowledge managers, linkage agencies, and capacity builders, and that the range of their tasks may involve “articulation work, communication work, identification work, mediation work, educational work, and so on” (p. 121). In discussing the often-invisible work of the broker, his high level description of the broker role illustrates a stimulating though perplexing image:

Knowledge brokers produce, enable, and facilitate movement, and they themselves are in movement. They move back and forth between different social worlds. Not only are they transferring knowledge in one direction only, they are engaged in the exchange of knowledge through moving between places. (Meyer, 2010, p. 123)

Similar to Meyer, two broker-researchers, Morton and Phipps (2013) also advance an illustration of the knowledge broker as a seemingly mythical creature (p. 261). They acknowledge the challenge in discussing KMb work, skills and qualities, as it is a developing profession and field. Nonetheless, Morton and Phipps urge that such articulation is crucial, as the need for KMb professionals and an evidence base for KMb practice continue to grow:

Until the profession is more developed, the opportunity to share emerging successes and challenges will be important in developing and understanding what it means to be a KB [knowledge broker] and what training might support the development of suitable skills and qualities. (p. 263)

There is a need for a deeper and nuanced understanding of what KMb work entails and requires, in terms of qualities, skills, and competencies. Meyer (2010) advocates for more research on the knowledge broker, asking researchers “to analyze more thoroughly their practices, the devices they create and use, and the benefits and drawbacks from their peripheral status” (p. 123).

KMb competencies

Recently, Barwick et al. (in press) attempted to identify core skills and competencies for KMb (though they employ *knowledge translation*, KT, the term predominantly used in Canadian healthcare research). Surveying practitioners working in diverse roles and various settings, Barwick and colleagues categorized the responsibilities of knowledge translation practitioners (KTPs) into three tiers. In the top tier alone, there is diversity. The main responsibilities of the KTPs surveyed range from planning KT events to managing projects, identifying knowledge gaps to planning KT, developing KT strategies to brokering and managing partnerships and networks. Further, they organized KTPs’ desired skills according to theme: practice, project

management, intellectual property, knowledge, and social and networking. The participants illustrate the diversity of perspectives on required competencies and skills. In 1978, McGaghie et al. (1978) cautioned about competencies for physicians, and this argument equally applies to KMb practitioners:

Competence is bound to local political, social, and economic circumstances, to . . . needs, to the availability of resources, and to the structure of the . . . system. Thus, any effort to find a universal definition of competence will inevitably fail. The ‘good physician’ in one setting may be totally incompetent in another (p.23).

Similarly, the ‘good knowledge mobilizer,’ intermediary, or broker is not so easy to decipher and define; further, context is a crucial component in understanding KMb work.

Padek et al. (2015) also sought to identify competencies for KMb. Employing the term *dissemination and implementation* (D&I), the authors employed various steps to collect then condense a competency list. A group of seven researchers developed the preliminary list of competencies; these North American researchers collectively had expertise and knowledge of KMb across professions and jurisdictions. The seven also had prior experience in delivering KMb training. This list of competencies went through another filtering process with 16 reviewers. Padek and colleagues organized 43 competencies into four domains: Definition, Background and Rationale; Theory and Approaches; Design and Analysis; and Practice-based Considerations (p. 6). 124 additional researchers sorted these competencies¹ into Beginner, Intermediate, and Advanced competencies. The authors reveal that the researchers attributed most of the competencies as Intermediate competencies, and even fewer Expert competencies; thus, it was challenging to determine the levels of competencies with specificity and accuracy.

¹ While Padek and colleagues’ study employed a card sorting activity, it is important to distinguish that they did not employ the Great Eight Competencies nor Q-Methodology. Hence, this study is not included in the later Methods section.

Padek and colleagues predict this lack of clarity “may be an indication that the field is growing and researchers are still unclear of what constitutes advanced-level D&I knowledge” (p. 5).

In addition to illustrating the splintered KMb terminology, these two studies demonstrate that there is no shortage of diverse, unsettled, and sometimes contradicting understandings of KMb work. Recognizing the diversity and differences, and zooming out of specific KMb contexts, professions, disciplines, and fields, this study seeks to focus on perceived priority activities, and the skills and competencies employed by individuals within this field, to better understand and illustrate KMb work. Additionally, this study will employ a validated measure to help frame priority competencies within the existing research on workplace competencies.

Defining competencies

Indeed, there is a growing desire to define what activities constitute KMb, and what core competencies and skills are required for this work. However, various meanings and definitions of the terms *competence*, *competencies*, and *skills* exist, creating challenges and confusion similar to the terminology used to describe KMb. Seemingly operational and straightforward definitions of competencies belie the confusion that exists around this topic. For instance, Heinsman (2008); Hoffmann (1999); Markus, Cooper-Thomas and Allpress (2005); McGaghie, Miller, Sajid and Telder (1978); Messick (1984); Neary (2002), Parry (1998); Ruth (2006); and Shippmann et al. (2000) all illustrate the inconsistency and complexity of terminology, indicating that competency is often a misnomer. Brown and Knight (2004) claim that, “The notion of competency probably replaces, albeit at a more sophisticated level, the concept of skills. That doesn’t necessarily make it easier to understand what competencies (or skills, come to that) are, let alone how they are to be recognized” (p. 27). Bartram (2005) distinguishes between competency and competencies:

Competence . . . relates to performance or outcomes, and involves the description of tasks, functions or objectives. Competencies, on the other hand, relate to the behaviours

underpinning successful performance; what it is people do in order to meet their objectives; how they go about achieving the required outcomes; what enables their competent performance. (p. 4)

Bartram also goes on to say that a job competency model does not include “specification of knowledge and skills” (p. 4). There is a push for clarity, however, as specificity regarding KMB work supports developments in education, training, hiring and recruitment, and professional development. In particular, Green (1995) emphasizes the growing need for developing broad competencies rather than discrete and specific skills: “Increasingly the demand is not for people trained with particular occupational skills but with the general ‘over-arching’ capabilities that will allow them to cope with continual change in their working environment” (p. 14).

Kurz and Bartram (2002) explain competency as “the repertoire of capabilities, activities, processes, and responses available that enable a range of work demands to be met more effectively by some people” (p. 230). Cooper (2000) distinguishes between core and workplace competencies, stating that core competencies “can be more generic” while workplace competencies often vary depending on the job position or project (p. 3; reproduced as Table 1). This is also echoed by earlier writers such as Ashworth and Saxton (1990), Hyland (1993), and Parry (1998). In trying to articulate common misconceptions about competency, Parry (1998) illustrates how managers will conflate competencies with skills, personality traits, and values.

Table 1: Core competencies vs. workplace competencies

	Core	Workplace
Scope	Organization	Individual
Purpose	Strategic	Tactical
Participant(s)	Business unit (and above)	Worker
Tasks	Processes	Activities
Competencies	Global	Position

Reproduced from Cooper (2000), p. 3

In discussing some of the varying understandings and definitions of competence, Neary (2002) illustrates that competence is complex and cannot be clearly nor completely demarcated. Building on the work of McGaghie et al. (1978) on competencies in medicine, Neary (2002) discusses the commonalities in professional competencies:

The desirable attributes of a professional, whether lawyer, teacher, hairdresser, physician, or basic medical scientist, are determined by many influences. Expert opinion, the practice setting, the types of clients and their problems to be encountered, the nature of a discipline or a specialism, the stage of socio-economic development of a community or nation (present as well as future) all need to be considered. (p. 147)

For Neary, competencies rely on professional knowledge, including awareness of contextual, theoretical, and practical information. Messick (1984) further demonstrates that knowledge is a crucial part to competency, and knowledge itself is quite diverse:

A person's structure of knowledge in a subject area includes not only declarative knowledge about substance (or information about what) but also procedural knowledge about methods (or information about how) and strategic knowledge about alternatives for goal setting and planning (or information about which, when, and possibly why). (p. 156)

Hyland (1993) maintains that such knowledge has often been overshadowed and assumed, with the overemphasis and focus on performance (p.60). With a critical perspective towards competency frameworks, Ruth (2006) illustrates the challenge in understanding competence: “Even if one may gain some sense of what competency might be, however problematic, then assuming it can be developed and, furthermore, that there is a link between its development and

practice and performance, the question of how to develop it remains” (p. 207). For Hyland (1993), competence is often examined in reductionist, instrumental, and oversimplified ways.

Indeed, like Hyland and others, I recognize that there are multiple layers and nuances to what makes a person knowledgeable, skilled, and competent in their line of work. Relating back to KMb, with the growing emphasis on intermediaries' roles, such need necessitates a baseline understanding of what this work looks like and what competencies and skills are required to be effective.

Broad competencies: Great Eight Competencies

Despite the various and ambiguous understandings and definitions of competencies, workplace training and hiring needs push for the definition, operationalization and assessment of competencies. The Great Eight Competencies Framework, also referred to as SHL’s Universal Competency Framework (UCF), provides a validated measure for competencies. Bartram (2005, 2006) advances this framework. Working with SHL to develop competency frameworks for various organizations using their UCF, Bartram argues that this work is evidence-based. This competency framework divorces competencies from knowledge and skills. Because competencies are meant to be broad and can deal with behaviour, knowledge, and skill, they can be generic across various domains and fields, professions and occupations, jobs and roles, institutions and organizations. SHL’s UCF, or the Great Eight Competencies, will be employed for this study.

Very few studies have explored the Great Eight Competencies within the field of KMb. One example is Francis-Smythe and Haase (2006). The authors utilized mixed methods to learn more about the knowledge transfer and exchange activities and competencies of academics. Utilizing focus groups and a survey, they identified Presenting and Communicating Information

and Relating and Networking as the most important competencies, both housed under the larger domain of Interacting and Presenting (p. 30). A selection of other studies will be discussed later in this paper.

Research Questions

Given the lack of clarity around KMb, and in particular, the core competencies and skills required to engage in this work, this study seeks to learn more about KMb activities, competencies, and skills, as identified by experts and professionals (researchers, intermediaries, brokers, and practitioners). This study explores the diversity of perspectives and practices in order to identify common approaches. The questions guiding this study are:

RQ1. How might we conceptualize the organization of KMb practices in terms of competencies?

RQ2. How might we measure these competencies?

RQ3. What are the priority groups of KMb competencies, according to KMb practitioners and researchers?

RQ4. How might we account for these different groups of KMb competencies in practice?

Methods

Chapter overview

This chapter details the methods employed in the study. First, I briefly explain Q-Methodology and discuss Q-studies related to KMb and competencies. I describe how this project provides a different approach and perspective to the study of KMb. I then detail the data collection methods, including participant inclusion criteria and recruitment, the development of the Concourse and Q-sample, the online Q-survey, and the p-sample. Afterwards, I give details on the procedures of the survey. I reflect on the use of this methodology, discussing both strengths and weaknesses: in particular, I focus on the challenges of definitions and self-selection. I then conclude with final thoughts on employing Q-Methodology for this study.

Q-Methodology explained

Q-Methodology is a research method that “systematically and holistically identify[ies] different types of people, or different types of mood, types of viewpoint and so on, across different life domains and contexts” (Watts & Stenner, 2012, p. 14). This methodology uses individuals as variables (p. 16), enabling them to express (and a researcher to capture and investigate) subjective viewpoints. As described in Brown (1980), Stephenson (1953), and Watts and Stenner (2012), this is done through a Q-study. It involves the sorting of a set of statements, also known as the Q-sample; an individual is required to rank-order these statements in terms of a condition of instruction (usually from most agree to most disagree). These statements or opinions are derived from a Concourse, or a body of text representing what can be said about the topic under investigation. The participants make up the p-sample: they are selectively and intentionally recruited. From the completed q-sorts, an identified factor characterizes “a group of persons who have rank ordered the provided items in a very similar fashion or, in other words . .

. group[s] of persons who share a similar perspective, viewpoint or attitude about the topic at hand” (Watts & Stenner, 2012, p. 22). Brown (1980) describes a q-sort as providing an

individual's conception of the way things stand. As such, it is subjective and self-referent . . . there is no right or wrong way to do a Q sort. The individual merely operates with the sample of statements in order to provide a model of his viewpoint vis-à-vis the subject matter under consideration . . . all is subjective, yet the factors are grounded in concrete behaviour, are usually reliable and easily replicated, and happily, are subject to statistical summary which facilitates more careful description and comparison. (p. 6)

Thus, Q-Methodology supports the expression of individual viewpoints alongside the statistical identification and comparison of shared viewpoints.

Explanation and justification of methodology

This particular methodology helps support the intertwined, complex study of KMb and competencies. In particular, "Q methodology is of utility in penetrating a situation in which the self is intimately involved . . . it is also possible through use of these methods to penetrate a situation more deeply, to analyze a single person or group intensively" (Brown, 1980, p. 58). This method enables us to decipher and interpret KMb work – efforts that are often invisible or misunderstood (Meyer, 2010). Q-Methodology provides an interesting approach to the topic of KMb, as conversations on practices and perspectives are often ambiguous. This study leverages the operationalization of subjective perspectives, or opinions (also known as operant subjectivity) by studying viewpoints related to KMb activities, competencies, and skills. As earlier discussed, there is often a conflation that occurs when describing competencies, skills, and behaviour (Parry, 1998). Certainly, this conflation has been captured in Q-studies (for instance, see von Essen and Sjöden, 1991). Insights into shared viewpoints on ideal behaviours, implicit beliefs, and prioritized competencies can be captured through this research method.

Q-methodology and competencies

Several studies employ Q-Methodology to investigate competencies in various professions and contexts (for instance, Bang and Montgomery, 2013; Hurd, Beggs, and Fokken, 2009; Phelan & Sharpley, 2012; Turley and Bieman, 1995; Wingreen, Blanton, Newton & Domino 2005). Hurd, Beggs and Fokken (2009) explored board member competencies, with a focus on public park and recreation boards. In using an established list of competencies for the Q-sample, they asked board members to choose which competencies they themselves value. The authors maintain that determining preferred competencies enables the creation or development of an effective and efficient board (p. 39) – that is, by understanding preferences in board member makeup, one can search for specific competencies in prospective members or cultivate such competencies in existing members. Similarly, Turley and Bieman (1995) pursued ideal competencies for software engineers. Seeking the competencies for “exceptional” software engineers, they interviewed 20 engineers, 10 exceptional and 10 nonexceptional. They also interviewed their managers for their opinions. The authors do not give a definition or criterion for what they deem “exceptional” – to find their 10 exceptional engineers, they asked managers to identify exemplary workers (p. 21). Wingreen et al. (2005) explored training and development priorities of Information Technology (IT) professionals: Q-statements either implied or explicitly referred to a particular kind of skill or competency. For instance, IT management skills were listed as a training priority, while competencies related to collaboration or teamwork were implied by activities such as “cross training with work colleagues.” Bang and Montgomery (2013) investigated the viewpoints of international graduate students to learn about their adaptability for and acculturation to graduate studies in the United States: they determined a

wide range of competencies for adaptability that span across social, emotional, cultural, and communication domains.

Interestingly, Caldwell and O'Reilly III (1990) employed Q-Methodology to measure person-job fit. While the authors did not conduct a Q-sort with any individual working in the area of KMb, their study design is unique. In order to develop the concourse for the Q-Sample, the authors interviewed between three to five individuals knowledgeable of the particular job, including individuals formerly holding this role or someone who supervised an employee in that position (p. 650). In asking practitioners and supervisors, the authors were able to decipher and define roles and responsibilities. A similar approach was employed for this study.

Q-methodology, KMb, and competencies

While a growing number of Q-studies on competencies have been published, few Q-studies explore knowledge mobilization. Selected articles will be discussed here in order to shed light on the research design and rationale for this study.

There are only three known articles that explore KMb competencies using the Great Eight Competencies Framework, two of which utilize aspects of Q-Methodology. Truch, Bartram, and Higgs (2004) investigated the correlation between knowledge sharing and worker personalities, and leveraged the Big Five personality traits, SHL's IMAGES™ personality measure, and a competency list, or inventory, developed using SHL's UCF, or the Great Eight Competencies. Using questionnaires, workers across 28 organizations were asked to rate competencies according to importance in their own work/jobs. Peers were also recruited to rate these workers (p. 138). In collaborating with a larger working group, the authors situate the competencies within a model for Knowledge Sharing with three distinct processes: building relationships, building a knowledge base, and building knowledge value (p. 134). Earlier

discussed, Lindsey's Q-study (2003a, 2003b) on knowledge sharing barriers in one organization interviewed and surveyed a total of 219 knowledge workers (153 for the final Q-sort). Using the existing literature and four expert interviews, Lindsey developed four vignettes and a Q-sort for a field experiment. For the next phase of data collection, he leveraged two research tasks: the Q-sort and the vignette analysis, alongside a short survey using a five-point Likert scale. Thus, his dissertation study did not solely utilize Q-Methodology, and indeed, his findings and analysis only marginally discuss what emerged from the Q-sort. As well, Gregory (2008, 2009) utilized interviews and a card sorting activity, a part of SHL's methodology for UCF. To determine core competencies for communication, Gregory interviewed "top" senior communicators and surveyed individuals in and outside the National Health Service (NHS). Arguably, these communicators do certain KMb work, as strategic communication and KMb do indeed overlap (Barwick et al., 2014). Gregory's participant sample was diverse, and she recognized that even within the NHS, there was great diversity in how communicators understood and prioritized communication within the organization. Two competencies emerged for communicators in the private sector that were not deemed important by NHS communicators. Gregory's survey also asked participants to rank-order the competencies according to importance. While this study has crucial differences from Q-Methodology, particularly for its lack of factor analysis of the sorts, Gregory's study is similar in its rank-order card sort activity. Related to this, in the work of Lievens, Sanchez, Bartram, and Brown (2010) – Bartram and Brown being from the SHL Group – the card sort related to the UCF is described as using a "q-sort method" with free distribution, or "without forced rating distribution" (p. 565). However, neither Gregory nor Lievens and colleagues follow suit with a full Q-study or analysis in its conventional form. Together, these articles illustrate the potential in examining KMb deeper by using the Great Eight Competencies.

Coupled with Q-Methodology, this study, detailed next, supports the identification and classification of competencies based on individuals' subjective opinions.

Summary of the Q-study

Unlike the Q-studies on KMb and competencies earlier discussed, this study uses Q-Methodology as its primary research approach, in terms of data collection, procedures, and analysis. This study involved in-person expert interviews and focus groups; the content from these interviews and focus groups created the Concourse. The group interviews in particular were ideal as participants developed their responses in dialogue with others. The recruited experts worked in units or organizations that provide KMb services, mediation and/or support; alternatively, some were researchers whose work focused on KMb. An online Q-sort, using the software FlashQ, supported the collection of a larger person sample, or p-set. The online Q-survey allowed for multiple Q-sorts to take place, at any given time, from any location. Participants also had the opportunity to add clarifying remarks and comments to their rank-order choices. A short questionnaire and activity-rating task using Likert scales accompanied the Q-sort. Some participants voluntarily provided contact information for future follow-up. Ryerson University's Research Ethics Board approved all components of this study.

Working together, the interviews, focus groups, and Q-survey (Q-sort, activity-rating task, and questionnaire) all served to help develop a deeper understanding of the range of subjective opinions on priority skills, competencies, and activities for KMb. A detailed description of these methods now follows.

Research Design

Data Collection Methods.

Phase 1: Development of the concourse with interviews and focus groups.

Similar to Turley and Bieman (1995), this study employed two phases of data collection, the first being expert interviews. While Turley and Bieman sought polar opposites (exceptional and nonexceptional engineers), the present study focused on finding a range, capturing the diversity of KMb practices and perspectives. From April to June 2015, I conducted interviews and focus groups with a total of 20 KMb experts. These individual and group interviews lasted no longer than one hour. The experts were selected from staff directories of KMb units or organizations in Canada, England, and Scotland, as well as through references in the literature. Participants were also keen to suggest and recommend other experts to consult (snowball sampling). The recruitment email can be found in Appendix A. The interviews took place in private office spaces or boardrooms, determined by and agreed upon by both the interviewer and participant(s) in advance. For reference, the semi-structured interview protocol can be found in Appendix B.

When Caldwell and O'Reilly III (1990) investigated job-person fit, they interviewed people who were or had been employed in the roles being studied. They also interviewed those who supervised individuals holding such roles. Similarly, this study looked to KMb brokers, intermediaries, and researchers to learn about their personal experience, expertise, and perceptions of the overall practice. Indeed, they were all deeply embedded and “intimately involved” (Brown, 1980, p.58) in KMb work. Two were recently retired from long careers in this field. A demographic breakdown of the expert interviewees can be found in Appendix C.

Development of Q sample.

All interviews and focus groups were transcribed by me. In consultation with my research supervisor, I looked at the transcripts, or concourse, for opinion statements on skills and competencies. As well, participants made reflective remarks about KMb as a practice and mentioned the range of activities in which they engage(d). I collected a variety of statements to ensure coverage across the Great Eight Competencies (Bartram, 2005; also see Appendix D). These statements were cross-referenced and adapted in consultation with my supervisor. In total, 49 subjective reflection statements and skills/competencies/behaviour statements were used for the electronic/online Q-Sort. See Appendix E for the full Q-Sample and Appendix F for the Q-sample organized into the UCF framework.

Activity-rating task.

To supplement the data collected from the Q-sort, an activity-rating component was developed for this study. Using the UCF/Great Eight Competencies Framework, I selected between three to five competency components from each of the Great Eight Competencies and posed them as questions with the following prompt: “Please rank each activity in terms of importance.” A total of 31 activities were placed on a five-point Likert scale (extremely important, quite important, somewhat important, hardly important, and not at all important). Some competency components were paraphrased or duplicated in order to reflect specific KMb practices. This activity was included as an exploratory measure, with the awareness that a research study with Likert scales alone may provide a skewed perspective on viewpoints. Cothrane (2010) maintains that participants may simply rank all items highly, limiting the potential for capturing the variance within and nuances of viewpoints and perspectives. The Likert scale also arguably fails to capture multiple or diverse value systems (p. 50). However,

data collected from this rating activity was used to compare and cross-reference the Q-sort findings. For a full list of the activities used in the rating task, with corresponding competency components, see Appendix G.

Contextual questions.

Additional survey questions were developed to garner insight on each individual's background and perspective, including his/her personal definition for KMb and preferred terminology, background training and education, experiences in KMb training and professional development, and current work role, responsibility, and context.

Phase 2: Q-Survey.

Using FlashQ, I developed an online Q-survey with 49 statements for sorting using an 11-point distribution (Appendix H), the rating task with 31 listed activities, and open-ended contextual questions. The Q-survey was first tested with the research supervisor, select colleagues, and KMb mentors for feedback and suggestions before the Q-sort went live to the public. This beta testing ensured the instructions were clear and the statements easy to understand. The online delivery enabled the survey to be completed at the participant's location of choice, such as at home, or in any other place with access to a computer (or laptop) and internet connection. See Appendix I for the full Q-survey protocol.

P-Sample.

The second stage of data collection – the Q-survey – recruited potential participants through the contact email lists and listservs for international, well-established organizations and networks for KMb. Specifically, listserv emails, blog posts, and social media were employed to promote the survey. The email recruitment template can be found in Appendix J. Individuals were also encouraged to forward the message to interested colleagues. Participants were asked to

self-identify for participation: they were to be a KMb researcher, knowledge broker, intermediary, or practitioner. Due to time constraints for this project, the online survey was open for two weeks. In total, 95 surveys were received. Four were incomplete, leaving 91 for analysis. Participants were employed across 12 countries, the majority located within Canada and the UK. Preliminary demographic breakdown of the Q-survey respondents can be found in Appendix K.

Reflections on Methodology

This section details various reflections regarding the online delivery of the survey and the self-identification component of the survey, as well as after-the-fact methodological considerations.

Online survey delivery.

Deploying a Q-study online has many benefits. Certainly, knowledge and skill for HTML coding is required, and it does take some time to develop and test the necessary data files for FlashQ. Though, once complete, the q-sorts can be administered without direct supervision and oversight of the primary investigator. There is no need for physical set-up beyond the successful programming. One is also relieved from logistical coordination for in-person sorts – booking rooms; printing forms, cards, and other resources; travelling to and from a location, for both participants or researchers; setting up the sorting grid; providing consistent and clear directions for each sort; and recording each respondent's data. The online delivery also enabled the collection of a larger p-sample. Had the sorts been done in person, there would have been a significantly smaller p-sample. Indeed, one can argue both ways for a larger or smaller p-sample (Brown, 2002; Caldwell and O'Reilly III, 1990). For the purposes of this exploratory study, the online delivery was ideal in order to recruit people from various countries, in a range of organizational settings.

The online delivery of the Q-survey also came with its challenges. Despite technical pre-testing for clear instructions and functionality, some participants experienced technical malfunctions (for instance, duplicate q-statements or unable to move to the next step) or issues with understanding instructions. Some sent email inquiries to clarify survey instructions or participant inclusion criteria, share technical issues, or discuss the study's methodology and underlying theoretical frameworks. Some participants commented that the sorting task was challenging – for some, too challenging to complete. Some participants found the forced distribution difficult – that is, choosing how to rank and order statements, with limits to the number of statements for each distribution value (Watts and Stenner, 2012). There was no ability to capture how many people opened the survey, or the number of people who attempted but did not fully complete or submit. I was not able to capture the total number of people who received an email, listserv, or blog post recruitment message. Hence, I do not have the ability to assess an overall participation rate. Nonetheless, 91 participants successfully completed and submitted the survey.

Self-identification for participation.

As earlier described, individuals from various KMb networks and communities were asked to self-identify as potential participants – as a KMb researcher, knowledge broker, knowledge intermediary, or practitioner interested or engaged in KMb. The term *knowledge mobilization* was used in the recruitment correspondence. However, given the varying definitions and labels to describe KMb, it is quite possible that the chosen terminology did not resonate with potential participants who received the recruitment message. It is possible that the incorporation and use of a term other than *knowledge mobilization* may have resulted in different participant demographics and recruitment numbers.

Methodological changes considered.

Given the constraints of the project timeline, the survey design described here was of reasonable scope and scale. However, potential alternatives for survey design and data collection methods did arise throughout the data collection process, upon data analysis, and in reflection. Of the various alternatives, two methodological considerations will now be discussed. If the timeframe for project completion had been longer, these adaptations may have been incorporated. However, given the project timeline, they were not included in any research design revision.

In a Q-study conducted by Turley and Bieman (1995), the Phase 1 portion of the data collection included the analysis of experts for psychological type using the MBTI tool. They also cross-referenced the competencies described in discussing critical incidents (p. 24) against the competencies noted by the managers and self-described by the engineers, prioritizing the ones that came from the interviews and ones that were common across more than one information source (p. 25). The authors facilitated multiple opportunities for validation, coordination, and alignment. Given the timeframe and scope of this project, I was not able to closely cross-reference and analyze each expert's statements across the Great Eight Competencies, nor cross-reference each interview transcript against each other. Instead, I tried to ensure breadth across the Great Eight Competencies. Such cross-referencing would be beneficial for a study attempting to discern explicit competencies for framework development; in contrast, this research is designed as an exploratory study.

As well, in their Q-survey, Turley and Bieman (1995) provided a definition of a competency, written as a statement, alongside a list of key behaviours (p. 28). Recognizing the common conflation of skills, competencies, qualities, and behaviours (Bartram, 2005; Parry,

1998), this may have been helpful to participants. However, such specification was not the goal for this particular Q-study. Instead, the conflation could be also interpreted as a holistic approach to understanding KMb functions, tasks, qualities, competencies, and skills. Holistic perspectives are indeed desirable for Q-studies as the methodology will help illuminate and untangle the parts of the whole (Watts and Stenner, 2012).

Final thoughts.

There are many ways to configure a Q-study. Various configurations would provide different angles to understand the topic at hand. As this is my first Q-study, there were indeed many learning points to take away from each and every step – from literature review, concourse development, q-sample development and participant recruitment, to factor analysis and qualitative interpretation. The multi-stage, mixed method approach of Q-Methodology was incredibly rewarding – the data collected was quite substantial. Nonetheless, there are countless ways to reconfigure the above research design and data collection methods.

A note on validation measures and Q-Methodology.

In discussing methods of measuring and validating constructs, or “attributes of individuals that cannot be directly observed, but must be inferred and indirectly assessed,” Murphy (2009) suggests that we should use such validation as “an ongoing process of forming and testing hypotheses” (p. 434). He goes on to describe how might this testing may manifest:

If you collect data to test these hypotheses, you will learn about what this test measures. If all of these hypotheses are supported, you might conclude (at least tentatively) that the test really does measure the construct [said construct]. As with all other types of hypothesis testing, conclusions about construct validity are always tentative, because there may always be some future hypothesis that is not supported. Thus, the task of construct validation is, in a sense, never complete. (p. 434)

This Q-study does not seek to necessarily develop a particular hypothesis or construct around KMb; however, in seeking to use a validation measure for competencies, this study enables us to

see if, tentatively, a construct on competencies can be developed using Q-Methodology. This study seeks to explore the potential illustration of shared viewpoints on competencies through a Q-sort and activity-rating task. Lievens, Sanchez, Bartram, and Brown (2010) already illustrate the challenge and complexity in rating competency of one occupation. This study acknowledges this and puts to the forefront this challenge in articulating, defining, and validating the ill-defined work and occupations related to KMb. The Great Eight Competencies Framework worked well to support this initial exploration, as it is one of the models Francis-Smyth and Haase (2006) describe as “generic and scientifically validated and therefore offer a good basis from which to develop new models for use in any workplace application” (p. 11). Together, the Great Eight Competencies Framework as a validated measure and Q-methodology as an exploration of subjective viewpoints, or operant subjectivity, supported a nuanced, holistic study with potential for further mathematical calculation, statistical analysis, and validation.

Findings

Viewpoints on KMb competencies, skills and activities

Analysis techniques.

PCQ for Windows was used to analyze the Q-sort data (Stricklin and Almeida, 2000). Earlier mentioned, out of the 95 submitted surveys, four were incomplete. Thus, 91 sorts were included in this analysis. I employed centroid viewpoint analysis with varimax rotation, then graphically rotated two factors so that most loadings were positive rather than negative. The varimax rotation yielded four distinct factors with loadings above 37%, accounting for 64 of the 91 sorts (70%). Of the 27 remaining sorts, 14 did not have any significant loadings on any one viewpoint (nonsignificant) while 13 sorts were confounded, or loaded on two viewpoints. The four-viewpoint solution provided a result with the fewest sorts loading as nonsignificant or confounded.

PCQ produced a model sort, or typical array for each of the four factors. Each model sort identifies three statements that participants most agreed with, and three statements that participants most disagreed with. These six statements form the basis of the qualitative analysis, alongside the open-ended comments respondents submitted on the statements they felt most strongly about. For a full list of the Q-sort results, see Appendix L. The three most agreed and the three most disagreed statements for each viewpoint were interpreted in reference to the Great Eight Competencies. This analysis uses a scoring range from -5 (Most disagree) to +5 (Most agree).

SPSS was then used to calculate the average scores for the Q-sort and activity-rating task across the Great Eight Competencies. For the Q-sort average calculation, the scores were first recalculated to 1 to 11 (rather than -5 to +5), 1 being most disagree and 11 as most agree. The activity-rating task used a five-point Likert scale, with Most important scored as 1 and Not at all

important scored as a 5. Any sorts that did not answer all activity-rating questions for each Competency domain were excluded from analysis.

Four approaches to knowledge mobilization

The Q-sort analysis using PCQ revealed four viewpoints on knowledge mobilization. Viewpoint A emphasizes KMb theory, established practice, and evaluation. Viewpoint B focuses on relationships and people. Viewpoint C maintains a big picture approach to KMb. Viewpoint D prioritizes visible KMb efforts, specifically brokering and communication. The following section details each viewpoint and compares the viewpoints for shared and divergent perspectives. The shorthand “S” is used for the word Statement.

Viewpoint A – Valuing theories and evaluation: an evidence-informed approach to KMb.

Viewpoint A prioritizes theory and evaluation in guiding KMb, grounding efforts in established and evidence-based practices and perspectives. Two of the most agreed upon statements (S35 and S22) focus on the importance of evaluation, while respondents weightily disagreed (-5) with dismissing theory for action (S1). Viewpoint A also maintains that KMb is not an easy skill set, disagreeing with the claim that many of the skills for this work are obtained in secondary, or high school (S23). Table 3a lists this viewpoint’s most agree and most disagree statements.

On understanding and using KMb theory, one respondent remarked: “We should be using theory to make things happen” (Respondent 6). In response to S1, “KMb is less about theory and more about making things happen,” one respondent stated, “Not true at all. I have been theorizing KMb for almost 8 years now” (Respondent 23). The respondent for Sort 78 shared that this theoretical and applied learning came from extensive training and experience:

“The skills I use on an everyday basis I learned in my PhD and postdoc – and on the ground, working to problem solve with knowledge users.” He also cautioned against simply “doing”:

“There is a danger in just doing without learning from past efforts and thinking about the work in a theoretical way – understanding what worked and why and how this could inform future work is essential to advancing KMb as a field rather than a practice.” Viewpoint A illustrates an integration of theory, practice and experience, and evaluation to inform KMb. Viewpoint A’s focus on theory is further illustrated by its unique scoring of Statement 33, on prioritizing the use of existing KMb frameworks (Table 3b). Other viewpoints either disagreed (Viewpoints B and D) or were neutral (Viewpoint C).

KMb theory and evaluation was reiterated by several respondents, in response to Statement 33 and other statements placed in the most agree column:

We are getting complacent and using the same things over and over again, and they might not be the right approach any more. (Sort 6 on S22)

KMb personnel often get bogged down in the small details and forget the big picture – evaluation and impact of ourselves. (Sort 6 on S21)

Frameworks are essential to upgrade KM strategies. (Sort 23 on S33)

Many believe KMb doesn’t employ the same rigour as other areas. Implementation science requires a framework to guide the development, implementation, and evaluation of KT efforts. (Sort 35 on S33)

The goal of KM is to effect outcomes so measuring and evaluating the implementation effectiveness is key. (Sort 40 on S35)

It is important to have a framework such as CIHR or another appropriate framework to guide the knowledge transfer process. Having an appropriate process will enhance the success of knowledge implementation and evaluation e.g. identifying knowledge gaps, developing implementation plans, etc. It will enhance the possibility for process evaluation and outcome evaluation. (Sort 40 on S33)

In particular, Respondent 30 consistently emphasized and reiterated the place of theory and evaluation in his open-ended responses.

The only way to ensure that we are meeting our goals and achieving our intended outcomes is to evaluate our effort. This should also be done rigorously through the use of frameworks and theories. In fact, I believe that a proper framework will ensure that teams are not only thinking about how they will mobilize knowledge, but how they will evaluate how well they mobilize it and to what extent that approach had impact. (Agreeing with S35)

The use of frameworks and theories allows us to design rigorous strategies and products that effectively address these factors for a higher likelihood of impact. (Agreeing with S33)

Despite his emphasis on frameworks and theories, Respondent 30 maintains that flexibility is equally important. In agreeing with Statement 38, that there is no one-size-fits-all approach, he points out that adapting is critical to KMb: “Being flexible, and understanding the preferences and context of the end-user is a must. A pre-packaged program that spans across borders and contexts is largely unachievable.” This flexibility and customization helps to advance the field. In disagreeing with the statement that prioritizes action over theory (S1), Respondent 30 shares his opinion on how theory and evaluation can best inform practice:

I firmly believe that theory should inform practice. This is not to say that one should spend a lifetime sorting out the intricacies of theory and never consider its application or praxis. However, I believe that an integrated approach of using theory to inform practice, and using evaluation to assess how well theory-based approaches work, with the goal of refinement, is ultimately the best way to go. (Disagreeing with S1)

Respondent 84 extends this idea by emphasizing that KMb researchers and practitioners must also report on their actions and practice; in doing so, the evidence base and knowledge on KMb can develop and expand:

It is crucial that we not only experiment, tailor, and try new things in new context, but we need to evaluate to contribute to what is known in the field, publish and share our results so that we are increasingly acting on what is known. Our actions should be informed by evidence and it's our responsibility to be aware of and build on the best available evidence so that we are having the greatest (most positive) impact possible and so that our attempts are appropriate. (Agreeing with S35)

Indeed, this viewpoint engages in KMb through the primary use and application of KMb theories, frameworks, established practices, and evaluation.

Viewpoint A also prioritizes using theoretical, empirical, and evaluative knowledge to inform how to best build and establish relationships and networks (S16). For instance Respondents 35, 40, and 78 prioritized building a culture around evidence use (S3), while Respondent 37 emphasized having a keen understanding of the audience and knowledge/end users (S2, S10, 38).

Table 3a: Viewpoint A’s Strongest “Most Agree” and “Most Disagree” statements with corresponding Competency Domain

Statement	Score*	Great Eight Competency Domain and Component
Most Agree		
35. Evaluating effectiveness and impact is so important.	5	6.2.3 Organizing and executing Monitoring and maintaining quality
16. The most effective people in KMb know how to build and establish relationships and networks.	5	3.1.2 Interacting and presenting Networking
22. We need to spend more time studying the uptake and usefulness of our KMb products and networks.	5	4.3.2 Analyzing and interpreting Testing assumptions and investigating
Most Disagree		
23. The skills I use on an everyday basis I learned in high school.	-5	4.2.2 Analyzing and interpreting Building technical expertise
1. KMb is less about theory and more about making things happen.	-5	1.1.5 Leading and deciding Taking action
47. Everyone in KMb is product-focused because that’s much easier and cheaper to do.	-5	8.2.3 Enterprising and performing Demonstrating financial awareness
*Score ranges from -5 to +5 For a full list of statements and scores, see Appendix L		

Table 3b: Statements that differentiate Viewpoint A from all other viewpoints

Statements	Viewpoint*			
	A	B	C	D
33. Using the Knowledge to Action (or another framework) is important.	4	-2	0	-2
*Viewpoint scores range from -5 to +5				

Viewpoint A's most agree and most disagree statements corresponded to five of the Great Eight competency domains: Analyzing and Interpreting, Organizing and Executing, Interacting and Presenting, Leading and Deciding, and Enterprising and Performing (Table 3a). Two statements corresponded with the Analyzing and Interpreting competency.

See Figure 3.1 for the model, or typal array for Viewpoint A, and Appendix M for the list of sorts significantly loading onto this viewpoint.

Figure 3.1: Model sort for Viewpoint A

-5 Most disagree	-4	-3	-2	-1	0	1	2	3	4	5 Most agree
1	13	15	29	8	6	5	11	2	3	16
23	14	24	32	18	7	9	19	4	21	22
47	42	39	34	20	26	12	27	10	30	35
	46	43	40	37	28	17	36	38	33	
			41	49	31	25	48			
					44					
					45					

Viewpoint B – The people-person.

Viewpoint B characteristically prioritized the individuals and communities involved in KMb – specifically, respondents discussed the importance of working with others (S10), seeking understanding (S7), and employing respect, empathy, and humility (S12). In response to Statement 7, Respondent 60 exemplified this viewpoint: “This is about relationship building and humility. Some of the biggest pitfalls are going in and making assumptions. Assumptions are strongly held knowledge, which make it difficult to listen to other people’s knowledges.” Similarly, Respondent 64 states, “I find that most individuals are people-focused. It’s people who are putting the knowledge into practice and engaging them in the process is really the key to making it work” (in disagreeing with S47). Moving from individual to organization, Respondent 33 maintains this need for understanding: “You need to understand who they are, what they want, and why they want it” (in response to S36). Viewpoint B agrees that expertise, credibility, and authority are developed through working with others, not through training or having practice experience (S14, S23). For instance, in response to Statement 14, Respondent 48 disagreed that a KMb practitioner requires a professional practice background: “Practice makes one perfect but on the other hand, there are numerous times I got engaged on delivering services only by having a small or no previous ‘practice’ experience [in] the field I was asked to provide my KM services.” Respondent 60 further emphasized that a practice background does not build credibility; instead, credibility comes from working with the target community: “It’s not about credibility in terms of doing the same job/having the same background. Credibility comes from the ability to listen and respond to other people’s knowledge and help turn it into action. It’s often difficult to see the value in knowledge from elsewhere if you are so embedded in

one ‘type’ of knowledge.” Table 3c lists this viewpoint’s most agree and most disagree statements.

For Viewpoint B, KMb is not "marketing for academics." Three respondents provided their thoughts in response to Statement 13:

KMb is about so much more than an individual researcher sharing their own research. (Respondent 28)

This is an oversimplification . . . KMb presents the evidence from the academics and reframes it for a situation that is more easily understood by those who can best use it. (Respondent 29)

I came from academics and still do some academic research. This is a standard perception of KMb from that practice but it is incomplete. This model implies a top-down model of knowledge dispersion from the experts to the lay practitioners. This is not KMb, it's just more of the same old didactic model that negatively impacts innovation. (Respondent 69)

Table 3c: Viewpoint B’s Strongest “Most Agree” and “Most Disagree” statements with corresponding Competency Domain

Statement	Score*	Great Eight Competency Domain and Component
Most Agree		
12. Respect, empathy, and humility are all essential when doing KMb.	5	2.1.9 Supporting and cooperating Showing empathy
7. It’s about seeking to understand first before trying to be understood.	5	2.1.1 Supporting and cooperating Understanding others
10. We need to understand our audience and speak to them, not at them.	5	2.1.5 Supporting and cooperating Listening
Most Disagree		
13. KMb is marketing for academics; we take what they have to say and spread that message.	-5	3.2.4 Interacting and presenting Promoting ideas
14. You need to be involved in a system in a practice sense or else you don’t have the authority for KMb.	-5	3.3.5 Interacting and presenting Projecting credibility
23. The skills I use on an everyday basis I learned in high school.	-5	4.2.2 Analyzing and interpreting Building technical expertise
*Score ranges from -5 to +5		

For a full list of statements and scores, see Appendix L
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Viewpoint B differed from the other three viewpoints in two respects (Table 3d). First, it ranked Statement 12, the statement prioritizing respect, empathy, and humility, as a Most Agree statement, scoring 5 compared to 1, 1, and 0 for the other viewpoints. Respondents qualified their ranking with the following statements:

You can't have a true understanding of another person/group and their situation without respect and empathy. And humility is realising that your role is really one of facilitation rather than anything “grandiose,” you are facilitating people's access to vital information. (Respondent 73)

You're working with people, and any time you do that, respect, empathy, and humility are needed. Otherwise, people won't respect or listen to what you have to say and won't be engaged in the process. (Respondent 64)

The respondent for Sort 66 further elaborated on this idea, indicating a priority in working from the perspective of the end-user:

Always remember that the person /problem to be addressed may have a completely different perception. You [might] see profit as a motive, but to the respondent risk may be a far more important consideration. Look [and] learn what is going on before trying to adjust existing patterns. What is more, where as the researcher is working, the respondent is giving up time where they could be working . . . The investigator must realise that they are operating from an entirely different standpoint than the respondent. The first is taking information substance which will gain something/promotion/a paper - the second will probably receive nothing they are giving, giving their time which is a part of their life for no real gain.

Secondly, Viewpoint B respondents also scored system-level thinking (S21) low compared to the other viewpoints (Table 3d). One participant ranked it as a most disagree statement, writing, “To me 'systems thinkers' are those that write the academic papers I read. We really need system thinkers 'plus', those who think systematically while interacting and communicating across all levels in organizations to actually facilitate and manage change.” Rather than to emphasize system thinkers, Viewpoint B highlights the intermediaries who work with people, communities, and end-users. These intermediaries build their credibility, expertise and knowledge by working

meaningfully with these groups. Further, Viewpoint B assumes that KMb involves teamwork (S20). Although the Viewpoint generally ranked this idea as neutral (score of 0 for S20), teamwork is a critical component in any KMb effort. In particular, Respondent 53 discusses the effectiveness of an eclectic, supportive team in two of her open-ended responses:

It's about us all being different and coming from different backgrounds but pooling our skills and resources . . . we can innovate and create because we understand why we're all here . . . because we're different[,] there are so many possibilities (Disagreeing with S44)

Become part of the team. Don't march in with your size 12 boots on and take over. Respect what's happened to date and start to work with them as a collective. The people you work with are your greatest asset. (Agreeing with Statement 7)

Table 3d: Statements that differentiate Viewpoint B from all other viewpoints

Statements	Viewpoint*			
	A	B	C	D
12. Respect, empathy, and humility are all essential when doing KMb.	1	5	1	0
21. We need system thinkers.	4	-4	4	0
*Viewpoint scores range from -5 to +5				

Thus, Viewpoint B believes that KMb is most successful when one engages with people, leveraging the efforts, experience, expertise, and skills of the collective group.

Viewpoint B's most agree and most disagree statements corresponded to three of the Great Eight competency domains: Supporting and Cooperating, Interacting and Presenting, and Analyzing and Interpreting (Table 3c). All three of the Most Agree statements corresponded with the Supporting and Cooperating competency, while two Most Disagree statements corresponded to Interacting and Presenting.

See Figure 3.2 for the model sort, or typal array for Viewpoint B, and Appendix M for the list of sorts significantly loading onto this viewpoint.

Figure 3.2: Model sort for Viewpoint B

-5 Most disagree	-4	-3	-2	-1	0	1	2	3	4	5 Most agree
13	21	15	24	1	4	3	8	2	9	7
14	34	42	31	25	5	6	18	17	16	10
23	46	44	33	30	11	26	19	28	27	12
	47	45	41	32	20	37	35	38	36	
			43	49	22	39	48			
					29					
					40					

Viewpoint C – A big picture approach propelled by variety and context.

Viewpoint C recognizes the diversity of the KMb field, emphasizes the various contexts in which a KMb intermediary may work, and approaches the work with a “big picture” understanding of the system at large. Viewpoint C also maintains the importance of understanding audiences or end-users. Table 3e lists the most agree and most disagree statements.

Respondents loading on this viewpoint agreed with Statement 38, emphasizing that KMb does not have a “one-size-fits-all” approach. Some respondents provided short and succinct statements to this ranking choice: “This is very true - context, goals, relationships, topics, etc. can (and often should) change the KT approach” (Respondent 15), “You have to build as you go along, and nothing is predetermined” (Respondent 10), “Knowledge brokerage and impact can't be prescribed. It has to fit the project aims” (Respondent 91). Others expanded in their open-ended response. Using the “cookie-cutter” metaphor, the respondent for Sort 13 maintains that

such an approach “is doomed to fail (at least some of the time).” Respondents 56 and 77 believe KMb requires flexibility and responsiveness in order for efforts to meet the specific needs of the particular project and audience:

A single one-sized framework, model or process cannot respond or be flexible to local context, to complex systems and situations or to external conditions. We need to adapt and learn. (Sort 56)

The best approach depends on the partners involved, their needs, their goals. I don't think that following the template is the answer, although it can be a really good start when you don't know how to make it work. After that, it's about testing and trying, and finding what works in this one particular case. (Sort 77)

Sort 77 recognizes the benefits in utilizing prior knowledge, “templates,” and established practices to guide and jumpstart KMb, but not to heavily prescribe or script the efforts.

Table 3e: Viewpoint C’s Strongest “Most Agree” and “Most Disagree” statements with corresponding Competency Domain

Statement	Score*	Great Eight Competency Domain and Component
Most Agree		
38. There is no one-size-fits-all approach to KMb.	5	7.1.1 Adapting and coping Adapting
29. The skills you need really depends on the role you play in the system of KMb.	5	5.3.1 Creating and conceptualizing Thinking broadly
10. We need to understand our audience and speak to them, not at them.	5	2.1.5 Supporting and cooperating Listening
Most Disagree		
44. There’s a need for a professional body to bring KMb people together and set industry standards.	-5	8.1.3 Enterprising and performing Pursuing self-development
23. The skills I use on an everyday basis I learned in high school.	-5	4.2.2 Analyzing and interpreting Building technical expertise

13. KMb is marketing for academics; we take what they have to say and spread that message.	-5	3.2.4 Interacting and presenting Promoting ideas
*Score ranges from -5 to +5 For a full list of statements and scores, see Appendix L		

On a related note, this viewpoint's responses to various statements highlight the contextual nature of KMb and the flexibility required to engage in this work. The respondent for Sort 68 stated "You have to be a lot of different things to different people." Respondent 72 argued that morphing is a requirement: "Without flexibility or adaptability, you will not be able to survive in this type of work." However, this overall sentiment is arguably assumed and commonplace to Viewpoint C, as it uniquely ranked Statement 16 on morphing as neutral (-1), compared to the other three viewpoints (Table 3f).

Table 3f: Statements that differentiate Viewpoint C from all other viewpoints

Statements	Viewpoint*			
	A	B	C	D
16. The most effective people in KMb know how to morph.	5	4	-1	5
*Viewpoint scores range from -5 to +5				

Viewpoint C upholds the belief that the skills required for KMb are also context-driven and that the skills to be employed depends on the role (S29). Responses loading on this viewpoint highlight the diversity in KMb roles and skills. The respondent for Sort 91 maintains that, "There are many skills and many needs in KMb . . . we need a big mix of skills." The following quotations illustrate this common perspective, detailing the great variance in KMb work:

Knowledge brokers need different skills [than] that [for] KT researchers [or] intermediaries, and different projects require difference roles and skills. (Sort 15)

I have found that there is a tendency to assume that all people in this line of work are the same and do the same job, and I just haven't found that to be the case. The skills you need will greatly depend on what sector you work in, what your specific job is and who you are working with. (Sort 67)

The skills required by someone who creates infographics or write plain language summaries will be very different from those most useful to a broker focusing on matching people, facilitating conversations. Both pieces are key to KMb, but could be used in very different situations for different goals. (Sort 77)

Zooming out of the specifics of each role, Viewpoint C balances a minutiae understanding of KMb with a big picture emphasis on context, audiences, and stakeholders. Responding to Statement 10, respondents expressing Viewpoint C believe KMb starts with first understanding audiences and stakeholders, while working collaboratively with them (versus speaking at them). Respondent 13 critiqued the use of the word *audience*, stating: “KMb is a process involving practitioners and researchers as well as KMb people and all need to know and understand what's going on and the perspective of the others. In some ways it doesn't even make sense to talk of an audience.” The absurdity, arguably, is that there is a misplaced dichotomy and separation between the various participants or stakeholders in the process. Working together in “co-design” or “co-production,” Respondent 56 suggests that rather than to use the term *audience*, it may be better to view these individuals as one’s peers and colleagues – collaborators engaged in KMb.

While emphasizing the contextual, flexible nature of KMb, Viewpoint C maintains that engaging in KMb work is not a calculated, technical job anyone can learn. In disagreeing with Statement 44 about regulating or professionalizing KMb, respondents uphold the belief that the field is too diverse for a regulating professional body. However, Respondent 16 stands out in clarifying that this work is indeed specialized. Responding to Statement 44, he writes,

I don't think anyone can get into this work. As we learn more about skills and competencies and qualities of knowledge brokers, we learn that this is not a job for

anyone. Job ads are becoming more sophisticated in terms of their requirements for the job. Not everyone can do this job. Not everyone thinks they can do this job.

The complexity of the work is confirmed in the viewpoint's communal disagreement to Statement 23, which states "The skills I use on an everyday basis I learned in high school." Sort 91 shares that her KMb skills were developed "on the job, in research, in practice." Rewinding farther than that, one respondent felt that KMb skills were not developed in kindergarten or high school, but rather as part of one's overall socialization and upbringing (Respondent 10).

Viewpoint C respondents differ in where they attribute their core KMb learning – some claim that they learned on the job. Some learned KMb through various professional work (Respondent 31), while others (Respondent 68) claim that postgraduate training develops KMb skill and aptitude. Respondent 77 eloquently shares her belief in the gradual accumulation of skills, that one's competencies for KMb is developed over time through a variety of experiences:

While it's true that some of the skills can seem very generic (writing, listening, facilitating) rather than technical, doing KMb requires a capacity to analyze and find solutions that goes way beyond what we learned in high school. We started developing these skills in school, but mastering them necessitates experience working in this field - actually, working in many fields, in order to be able to understand different systems and being able to adapt to them and transform them.

She details the range of skill – technical know-how, analytical skills, to high-level system level thinking. Indeed, for Viewpoint C, KMb learning does not occur during the teenage years of high school education.

Sorts loading on Viewpoint C also indicate a shared disagreement in Statement 13, that KMb is marketing for academics. Condemning the dichotomy of "them" versus "us" (Sort 10), respondents felt that the idea of one-way communication or dissemination (Sort 16) was "too simplistic" (Sort 67). Instead, Viewpoint C emphasizes that knowledge users play a crucial and primary role in KMb. Dismissing research dissemination, one respondent claimed, "No one

really cares about research – [we] care about the benefits from research” (Sort 51). Respondent 68 views the knowledge user or end-user as the driver for KMb and clarifies the need for relevance and utility: “The end user decides how they want to use the evidence, not the academic. And it's not just spreading the message, it's implementing it in a way that's usable to the end user (e.g. clinician).” In discussing engaged scholarship and community-based research, the respondent for Sort 77 advances reciprocity and receptiveness in KMb, going far beyond the researcher-focused, one-way dissemination approach to knowledge production and use:

KMb is about sharing and using knowledge, but a simple push-out of research is far from the only way (or the best way) to do that. For me, doing KMb also means working with researchers to expose them to the importance of partnering with research users, understanding how they can best use community knowledge to inform their work, not only share research but find new ways to do research so it is more relevant, more useful, more impactful.

Despite the varied stances and implied methodological, theoretical, and disciplinary differences within Viewpoint C, respondents maintain a shared conviction that researchers are not the primary participants in KMb.

Each of Viewpoint C's most agree and most disagree statements corresponded to a different competency, loading onto six of the Great Eight competency domains: Adapting and Coping, Creating and Conceptualizing, Supporting and Cooperating, Enterprising and Performing, Analyzing and Interpreting, and lastly, Interacting and Presenting (Table 3f).

See Figure 3.3 for the model sort, or typical array for Viewpoint C, and Appendix M for the list of sorts significantly loading onto this viewpoint.

Figure 3.3: Model sort for Viewpoint C

-5 Most disagree	-4	-3	-2	-1	0	1	2	3	4	5 Most agree
13	15	1	6	2	8	3	7	20	9	10
23	34	11	18	4	17	5	28	22	21	29
44	45	14	31	16	19	12	37	25	32	38
	47	42	36	39	24	30	40	27	35	
			41	49	26	43	46			
					33					
					48					

Viewpoint D –Tangible KMb through communication and brokering.

Viewpoint D discusses KMb through two tangible modes: communication and brokering. Respondents emphasize the role of customized and creative communication in KMb, deeming it as a crucial component to build connections and networks (S18, S16). Words, images, and the variety of communication tools and channels were described as “the central component of KT” (Respondent 74), “extraordinary in conveying message[s]” (Respondent 85), and fundamental to “moving knowledge into action” (Respondent 42). Commenting on statement 48, Respondent 44 elaborated on digital communications, recognizing both the potential and challenge in leveraging the internet for KMb:

The ways people communicate are changing daily. There is a lot of information on the internet, and it can be tough to cut through to the real evidence-based information/knowledge. The more universities and other knowledge mobilization units change their traditional forms of dissemination to match the new online forums, the better and easier it will be to transfer knowledge and make impact on a greater scale.

For this respondent, KMb requires an awareness of communication innovations and a responsiveness to the digital “societal trends of the day.” Others shared this opinion that communication underpinned the flow of knowledge and information between individuals, through established relationships and networks (S16). Table 3g lists this viewpoint’s most agree and most disagree statements.

For Viewpoint D, communication, specifically two-way dialogue (Respondents 29, 8, 87, 40) is most effective in open relationships and networks – connections that are friendly (Respondent 85), collaborative (Respondent 32), and mutually supportive of the “uptake of research evidence” (Respondent 49). This dialogue “bring[s] the right people together” (Respondent 8), enabling change and implementation to happen efficiently (Respondent 8, 40). Diverse and customized communication echoes Viewpoint D’s emphasis that there is no one-size-fits-all approach to KMb (S38); rather, KMb must be “tailored” to each situation, audience, and issue (Sort 34). Relating back to communication tactics, the respondent for Sort 8 illustrates the multiple possibilities and avenues for KMb: “KMb can span a great number of activities from manuscript writing to holding focus groups to developing infographics. The format of KMb depends on the individual needs of the project and the target population.”

Certainly, Viewpoint D emphasizes the importance of communications and at first glance, it may seem that this viewpoint equates communication as KMb. However, Viewpoint C recognizes that KMb is not mere marketing for academics. Respondents strongly disagreed with Statement 13. Respondent 87’s response to this statement illustrates that KMb goes beyond communication and marketing:

KMb, as I understand it, is not just about moving academic work into the public consciousness. This statement oversimplifies KMb, and fails to acknowledge that good KMb also involves 1) tacit knowledge sharing - learning from each other (within teams and organizations, and across sectors) 2) academic knowledge than informs current

practice 3) academic knowledge that informs current policy 4) real world knowledge that can influence research and other academic agendas. 'Marketing' academic work is but a small part of KMb, in my opinion.

This respondent joins others in recognizing that knowledge is not merely disseminated. For Sort 8, it is "transferred" from, to, and between a range of stakeholders. This transfer indeed requires specific training and expertise – Viewpoint D significantly disagrees with statement 23 about obtaining KMb skills in high school. The extended comments from Sorts 87 and 26 illustrate examples of where Viewpoint D respondents developed their skills:

The statement oversimplifies the skills needed. If I rewrote, I could agree. Here is what I propose as a re-write: "Some of the skills that I use on an everyday basis were first learned in high school. However, each of these skills have been deepened and refined through interdisciplinary experience in work and in other personal pursuits. These include: reading, understanding key messages, writing clearly, social interaction, team work and leadership. A skill that I learned later in life was to integrate my subject matter expertise, developed after high school, into my every day work as a knowledge broker. (Respondent 87)

I totally disagree. Of course there are skills I learned then that I used as a KB. But there so many more things! It is important to understand what research is and how good research is done (the best way to learn this is by doing research that is I think a master degree in research is the minimum to be a good KB, a PhD is even better (if it is just learning how to read and understand a scientific paper as a minimum). There is also all the importance to have open and positive attitude at all time when doing such work (learning to deal with society), and so on. I could give a long list of examples . . . (Respondent 26)

Thus, the competencies and skills for KMb, Viewpoint D maintains, are developed over time, through experience; one's competence for this work is the result of the dynamic fusion of various skills, expertise, experiences, and perceptions.

Table 3g: Viewpoint D’s Strongest “Most Agree” and “Most Disagree” statements for Viewpoint D with corresponding Competency Domain

Statement	Score*	Great Eight Competency Domain and Component
Most Agree		
16. The most effective people in KMb know how to build and establish relationships and networks.	5	3.1.2 Interacting and presenting Networking
18. We move knowledge into action through powerful communications – words, images, films, all sorts of channels.	5	3.3.4 Interacting and presenting Presenting and public speaking
38. There is no one-size-fits-all approach to KMb.	5	7.1.1 Adapting and coping Adapting
Most Disagree		
13. KMb is marketing for academics; we take what they have to say and spread that message.	-5	3.2.4 Interacting and presenting Promoting ideas
14. You need to be involve in a system from a practice sense or else you don’t have the authority for KMb.	-5	3.3.5 Interacting and presenting Projecting credibility
23. The skills I use on an everyday basis I learned in high school.	-5	4.3.2 Analyzing and interpreting Building technical expertise
*Score ranges from -5 to +5		
**For a full list of statements and scores, see Appendix L		

According to the factor analysis in PCQ, Viewpoint D seemingly illustrates indifference for system-level thinking, as illustrated in its score of 0 for Statement 21 (Table 3h). However, deemed a “key skill” (Respondent 39) for KMb, system-level thinking is certainly valued by respondents. This thinking stems from one’s nuanced experience and perspective, described by respondents earlier. In responding to a similar statement (S27), the respondent for Sort 87 describes various skills employed in system-level thinking:

Having the skill to assess needs, and then think strategically about how to bridge those gaps - is crucial to mobilizing knowledge. Knowledge mobilizers take a step back, look at the big

picture (systems within systems, networks within networks) and bring their own creativity, leverage their connections, etc when addressing gaps in knowledge, capacity, and expertise.

For Viewpoint D, KMb may necessitate system-level thinking, but it is not a governing priority.

Table 3h: Statements that differentiate Viewpoint D from all other viewpoints

Statements	Viewpoint*			
	A	B	C	D
21. We need system thinkers	4	-4	4	0
*Viewpoint scores range from -5 to +5				

Viewpoint D's most agree and most disagree statements corresponded to three of the Great Eight competency domains: Interacting and Presenting, Adapting and Coping, and Analyzing and Interpreting (Table 3g). Interacting and Presenting loaded onto four of the six (62.5%) statements. See Figure 3.4 for the model sort, or typal array for Viewpoint D, and Appendix M for the list of sorts significantly loading onto this viewpoint.

Figure 3.4: Model sort for Viewpoint D

-5 Most disagree	-4	-3	-2	-1	0	1	2	3	4	5 Most agree
13	8	24	7	5	1	2	4	10	3	16
14	44	36	33	15	9	17	6	11	19	18
23	45	39	40	25	12	28	22	20	29	38
	47	42	41	31	21	32	30	27	35	
			49	34	26	37	48			
					43					
					46					

Comparison Analysis

Generally speaking, the four viewpoints maintain separate standpoints on KMb. Sorts loading on Viewpoint B approaches KMb with a focus on relationships and people, while Viewpoint A prioritizes theory and evaluation, Viewpoint C on process and big picture, and Viewpoint D communication products and brokering practice. Nevertheless, there were indeed points of consensus (Table 3i).

Table 3i: Consensus statements for all viewpoints

Statement	Score			
	A	B	C	D
13. KMb is marketing for academics; we take what they have to say and spread that message.	-4	-5	-5	-5
23. The skills I use on an everyday basis I learned in high school.	-5	-5	-5	-5
26. If we don't know what works, then we have to experiment!	0	1	0	0
41. I have to be receptive, if I am too enthusiastic, too intense, too driven, too passionate, it can put people off.	-2	-2	-2	-2
42. The general public is skeptical about research and researchers – KMb tries to mend this.	-4	-3	-3	-3
47. Everyone in KMb is product-focused because that's much easier and cheaper to do.	-5	-4	-4	-4
49. People wrongly exclude technology transfer and commercialization from KMb – it is definitely part of KMb.	-1	-1	-1	-2

As earlier discussed, Viewpoints A, B, C, and D all disagreed that KMb is marketing for academics (Statement 13). 27 sorts (30%) ranked this statement as one of their most disagree statements. For the respondents of this Q-survey, KMb is not simply research dissemination. All viewpoints also deemed that KMb requires a skill set, perspective, and expertise that is developed in life and training beyond secondary school education (Statement 23). 21 sorts (23%) ranked the high school skill statement as Most Disagree. Effective practice requires specialized knowledge, competencies, and skill. In his response to Statement 13, Respondent 31 synthesizes

various opinion statements from the q-sort, as well as positions for Statement 13 and Statement

23. In particular, he illustrates the special niche of the knowledge broker:

I disagree with this because in my experience [agricultural research and design work], KMb is not about marketing but about engagement and empathy - many researchers, again in my experience, can improve greatly how they engage communicatively with non researchers/other interest groups. Poor communication is partly, maybe largely, a matter of lack of exposure by researchers to communication outside the habits associated with academia. But once alerted to their own communication habits, it is possible for the researcher themselves to reach out and engage with the non academic. . . It is better in my view for the academic, if possible, themselves to do this, given their deep knowledge of the topic in question. But, yes, habits may need to be unlearned and new skills acquired, and some academics may not be interested in this communication role and therefore intermediaries will be needed. (Respondent 31, Viewpoint C)

Sort 31 speaks of an acute awareness to an intermediary's positionality – that is, there is a complex negotiation required to navigate between researchers and end-users for KMb.

Communication is not merely dissemination tactics; for Respondent 31, communication supports the building of positive, reciprocal relationships with various, non-academic stakeholders.

The two statements of shared neutrality or indifference are also worthy of note. First, there is an apparent indifference to the debate regarding the relevance of technology transfer and commercialization to KMb (S49), as Viewpoints scored this statement -1 (A, B, C) and -2 (D). One nonsignificant sort disagreed with this statement, and his open-ended reflection considers KMb across various professions and domains: "I'm not sure TT and commercializability [sic] are part of KMb - I can think of many examples in education (and other sectors) where this is not important or central to the core functions and goals of KMb." Secondly, experimentation was also a neutral concept across the viewpoints (Statement 26). However, this may be an assumed position for Viewpoints B, C, and D as these viewpoints place emphasis on the contextual and changing nature of KMb. Viewpoint A, on the other hand, prioritized established theories and

practices, as well as evaluation. For this viewpoint, KMb is grounded in “what works” or what is known, as opposed to experimentation.

Competencies across all Viewpoints

Mapping the q-statements across the Great Eight Competencies provides insight into how KMb intermediaries, practitioners, brokers, and researchers perceive their work and prioritize particular activities, competencies, and skills. Certainly, rating a particular statement and its associated Great Eight competency as Most Disagree does not mean the respondent felt the competency was unimportant. Rather, for the Q-sort results, the respondents demonstrate strong feelings and opinions towards the competency in question. The respondents’ chosen most agree and most disagree q-statements and their related competencies suggest strong positions. All eight Competencies were reflected in at least one of the Most Agree or Most Disagree statements across the four viewpoints. Cumulatively, of the 24 most agree and most disagree statements, seven statements concern Interacting and Presenting (29%), five for Analyzing and Interpreting (21%), and four for Supporting and Cooperating (17%). Two statements corresponded to the Adapting and Coping and Enterprising and Performing domains. One statement corresponded to each of the Leading and Deciding, Creating and Conceptualizing, and Organizing and Executing domains. See Table 3j for a comparison on how each viewpoint’s most agree and disagree statements aligned to particular competency domains.

Table 3j: Comparison of the four Viewpoints' number of Most Agree and Most Disagree statements with associated competency

Competency	Viewpoint A		Viewpoint B		Viewpoint C		Viewpoint D	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Leading and Deciding		1 (S1)						
Supporting and Cooperating			3 (S7, S10, S12)		1 (S10)			
Interacting and Presenting	1 (S16)			2 (S13, S14)		1 (S13)	2 (S16, S18)	2 (S13, S14, S18)
Analyzing and Interpreting	1(S22)	1 (S23)		1 (S23)		1 (S23)		1 (S23)
Creating and Conceptualizing					1 (S29)			
Organizing and Executing	1 (S35)							
Adapting and Coping					1(S38)		1 (S38)	
Enterprising and Performing		1 (S47)				1 (S44)		

Visualizing the Competencies

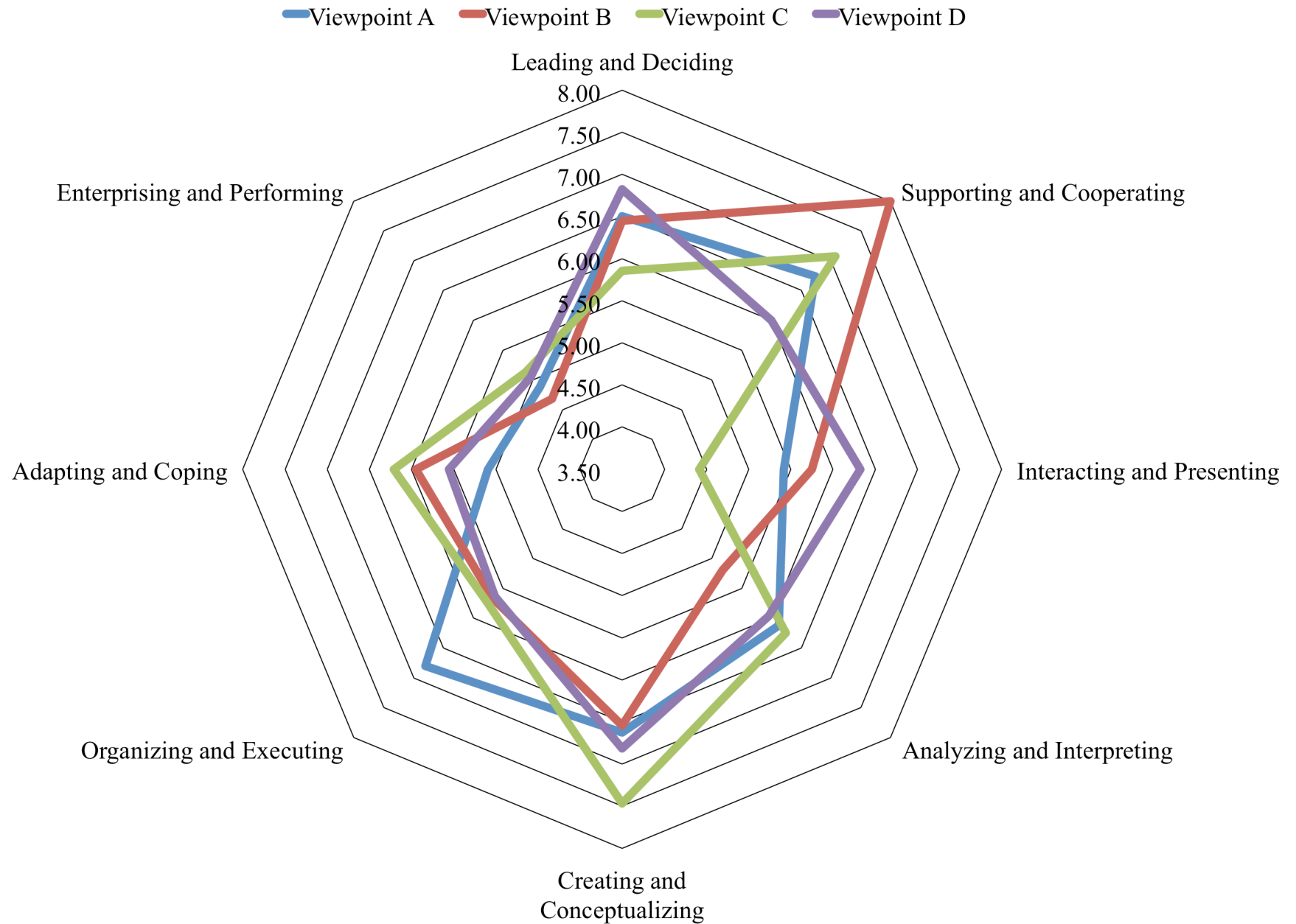
Using SPSS, average scores were calculated for each Competency domain for the Q-sort and rating activity results (Appendix N). Using Excel, I created illustrations of these average scores (Figure 3.5 for Q-sort, Figure 3.6 for rating activity) to show areas of similarity and divergence. These scores, at the time of paper submission, had not been tested for significant differences. However, the existing scores suffice in identifying differences across the competencies and viewpoints.

The Q-sort visualization (Figure 3.5) illustrates the relative prioritization of competencies for each viewpoint, skewed towards the most agree statements. Viewpoint A emphasizes competencies related to Organizing and Executing more than the other three viewpoints. Viewpoint B prioritizes the competencies related to Supporting and Cooperating and de-

emphasizes Enterprising and Performing competencies. Viewpoint C places primary importance on Creating and Conceptualizing competencies and downplays Interacting and Presenting. Viewpoint D scores Interacting and Presenting competencies high while scoring Supporting and Cooperating lower. All viewpoints share indifference towards Enterprising and Performing. This is in line with the qualitative findings and factor analysis from the Q-sort, as described earlier.

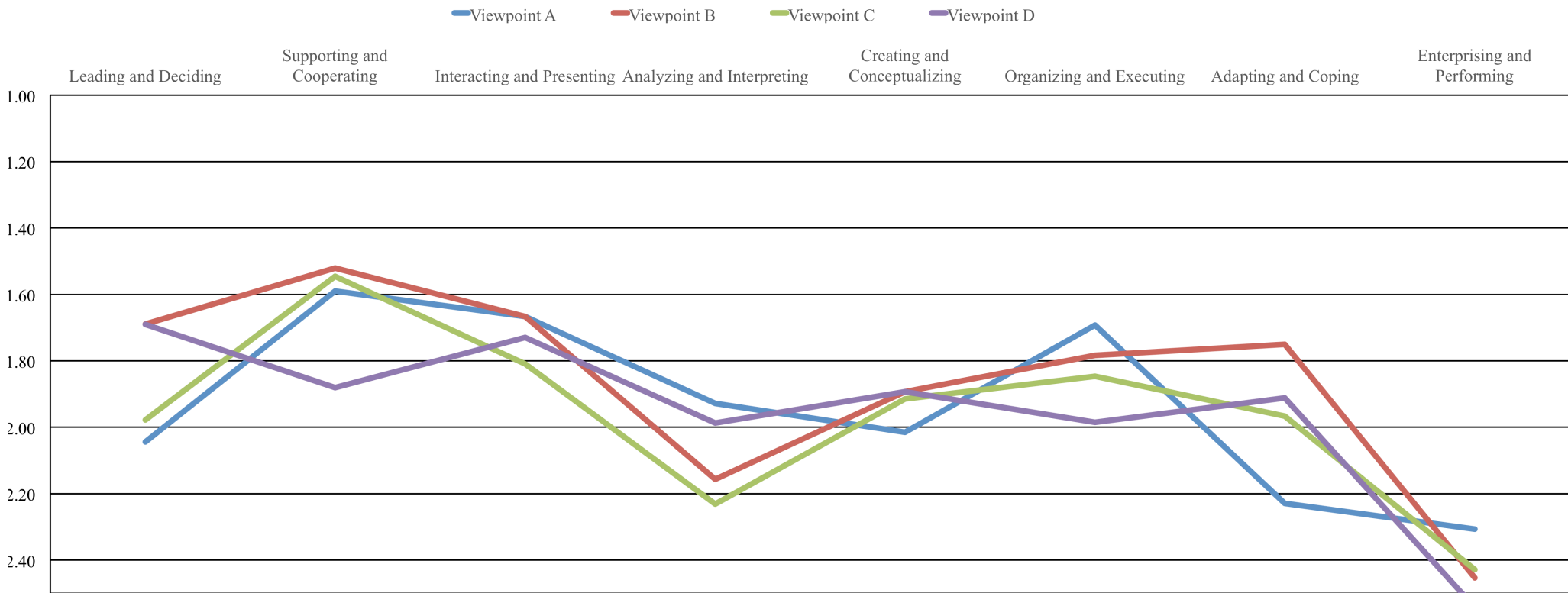
In analyzing the average scores and visualization, there appears to be mostly similar findings between the Q-sort and rating activity averages. Additional analysis on the average scores, as well as on one particular competency, Analyzing and Interpreting, will be described in the next section.

Figure 3.5: Visualization of Q-sort average scores across the Great Eight Competencies by Viewpoint



Scores range from 1 (Least Agree) to 11 (Most Agree)

Figure 3.6: Rating Activity average scores across the Great Eight Competencies by Viewpoint



Scores range from 1 (Most Important) to 5 (Not at all Important)

Discussion

KMb Competencies as indicated by viewpoints

This Q-study's use of the Great Eight Competencies sheds light on how practitioners, intermediaries, brokers, and researchers prioritize competencies for KMb. As a whole, the four Viewpoints make reference to all eight Competencies through their most agree and most disagree statements, with priorities on Interacting and Presenting (7 of 24), Analyzing and Interpreting (5 of 24), and Supporting and Cooperating (4 of 24) (see Table 3j).

From cross-referencing the most agree and disagree statements with the Great Eight Competencies, we see that Viewpoint B and Viewpoint D independently prioritize and emphasize distinct KMb competencies, while Viewpoints A and C express broad coverage across the eight domains. As Cooper (2014) illustrated with brokering organizations, this study shows that individuals engaged in KMb too can focus on particular activities and strategies. Alternatively, their work may engage in KMb for a variety of functions and purposes. Viewpoint B's focus on being "people-oriented" in KMb efforts match well with its two top corresponding competencies, Supporting and Cooperating (domain 2) and Interacting and Presenting (domain 3). Viewpoint D's emphasis on tangible KMb through communication and brokering is also mirrored in its prioritized competency, Interacting and Presenting (domain 3).

Critiquing the average scores – an exploratory test

The visualizations help to make sense of and compare the numerical values of the Q-sort and activity-rating task's average scores across the Viewpoints, for each competency domain. Generally speaking, the Q-sort average score and visualization align well with the Q-sort factor analysis and qualitative responses. However, the distinctions are not as clear or consistent with the rating activity average score results. As mentioned earlier, it is challenging to determine the

consistency and accuracy of Likert scale responses (Cothrane, 2010). This secondary survey component and analysis was exploratory, supplementing the Q-sort analysis. However, dissatisfied with the seemingly imprecise and differing scores from the rating activity, I employed a tertiary test to cross-examine the average scores.

As an exploratory test, I subjected the activity-rating average for the Analyzing and Interpreting competency for further scrutiny. Specifically, competency component 4.3.5 (Activity #24) refers to system-level thinking (competency 4.3.5), which is arguably distinct from other competency components within the Analyzing and Interpretation domain (see Appendix G for activities with corresponding competencies and Appendix D for the UCF). As described earlier, Viewpoint C prioritizes a big picture approach to KMb. In the first calculated activity-rating task average with all Analyzing and Interpreting activities included, Viewpoint C scored lower in this area compared to the other viewpoints. I wanted to interrogate if separating system-level thinking from the rest of the Analyzing and Interpreting competency would confirm Viewpoint C's emphasis on system-level thinking. The results are in Table 4a and Figure 4.

Table 4a: Rating Activity average scores across the Great Eight Competencies by Viewpoint, Analyzing and Interpreting broken down

Competency	Viewpoint			
	A	B	C	D
Leading and Deciding	2.04	1.69	1.98	1.69
Supporting and Cooperating	1.59	1.52	1.55	1.88
Interacting and Presenting	1.67	1.67	1.81	1.73
Analyzing and Interpreting	1.93	2.16	2.23	1.99
Analyzing and Interpreting A	1.95	2.04	2.37	1.97
Analyzing and Interpreting B (system-level thinking only)	1.87	2.60	1.80	2.12
Creating and Conceptualizing	2.02	1.89	1.91	1.89
Organizing and Executing	1.69	1.78	1.85	1.99
Adapting and Coping	2.23	1.75	1.97	1.91
Enterprising and Performing	2.31	2.45	2.43	2.54
Score range from 1 (Most important) to 5 (Not at all important)				

Viewpoint C first scored an average score of 2.23 in terms of importance for the Analyzing and Interpreting competency domain. However, in separating out the specific competency for system-level thinking, shown as Analyzing and Interpreting B, the new calculation reveals a higher score for system-level thinking (1.80) compared to the rest of the Analyzing and Interpreting competencies, listed as Analyzing and Interpreting A (2.37). These calculations are more in line with the original Q-sort qualitative findings and factor analysis. Thus, even within each Viewpoint and each competency domain, further cross-referencing and critical analysis would help to identify specific nuances within the competency scores. Given the timeline of this

project, each competency and Viewpoint could not be held to this level of analysis. Nonetheless, this exploratory tertiary test reveals that the scores can be broken down further for competency specificity and validation of the qualitative Q-sort results.

Identifying a hierarchy of KMb competencies

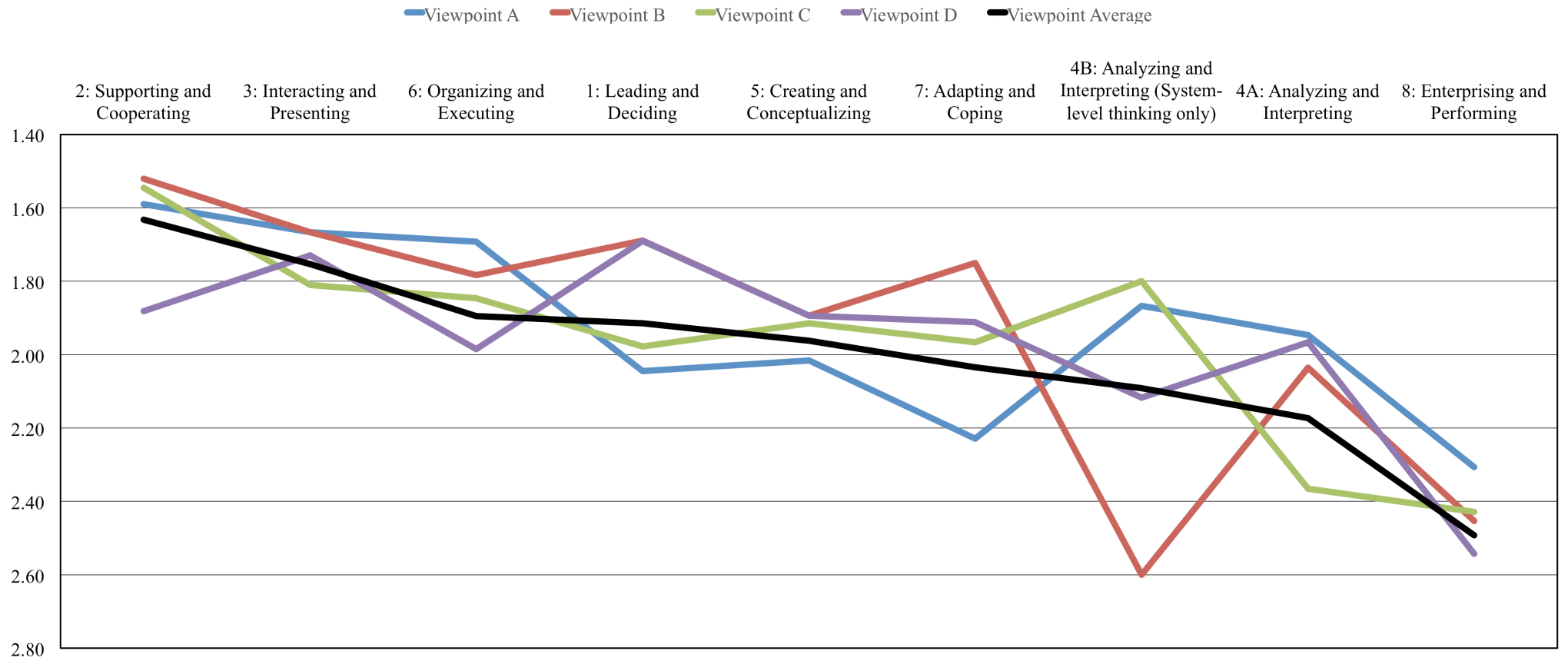
Mentioned earlier, the Q-sort task prompted respondents to rank order the statements from most agree to most disagree. It is a challenge, then, to claim that the calculated Q-sort average scores indicate and equate to importance. On the other hand, the activity-rating portion of the online survey explicitly asked respondents to rate the activities according to importance, using a five-point Likert scale (Most important, Quite important, Somewhat important, Hardly important, Not at all important). Average scores for each Viewpoint across each of the eight competencies were calculated. Eight averages were also calculated for each competency across all four viewpoints, then reorganized based on descending order. These scores are represented in Figure 4 (see Appendix O for numerical values). This visualization reveals that a hierarchy of KMb exists, and that the four Viewpoints correspond with this hierarchy's order with some areas of difference in emphasis, as shown by the black line. Those differences, certainly, are detailed in the factor analysis and qualitative findings from the Q-sort. However, this overall, averaged hierarchy provides a crucial starting point in identifying core competencies for KMb.

This hierarchy illuminates the priority competencies for KMb work, according to the survey participants. The top five competencies for the study participants, in descending order are Supporting and Cooperating (1.63), Interacting and Presenting (1.75), Organizing and Executing (1.90), Leading and Deciding (1.91) and Creating and Conceptualizing (1.96). Of lesser importance are Adapting and Coping (2.03), System-level thinking (2.09, part of Analyzing and Interpreting domain, separated here as Analyzing and Interpreting B), Analyzing and Interpreting

(2.17); and Enterprising and Performing (2.49). The complete UCF, or Great Eight Competencies with the listed competency components can be found in Appendix D.

The hierarchy of competencies, as determined by this study, identifies KMb practice primarily as a support role, focused on people. The second most important competency area builds on this, as its primary efforts are on relating and networking, influencing, and communicating with and to others. Planning, organizing, executing; leading and decision-making; as well as learning, creating, and innovating are also deemed critical components of KMb work. Indeed, this list echoes existing research in illustrating that KMb is incredibly diverse and employs a range of skills for various needs and purposes. However, it also demonstrates that a mixed group of KMb researchers and practitioners – specifically, 91 individuals across 12 countries – agree on this ranking and prioritization of competencies with some distinctions. While several terms and definitions litter and seemingly differentiate the field and practice of KMb, common approaches, perspectives, and practices certainly exist. Specifically, there is a general agreement in what practitioners and researchers regard as the most important competencies.

Figure 4: Hierarchy of KMb competencies using rating activity scores, in descending order of importance



Score range used in calculation
1 (Most important) to 5 (Not at all important)

Closing thoughts

Clarifying competencies for training and education needs

With the development of the knowledge broker role (Meyer, 2010), various organizations and institutions are prioritizing training, education, and hiring for KMb work. Hence, several training and education programs have emerged to tackle the workplace demands for this specialized role (for example, see Barwick et al., in press; Kho et al., 2009; Padek et al., 2015; Stamatakis et al., 2013; Straus et al., 2011). Brokers, managers, and researchers alike are demonstrating interest in the hiring needs, skill development, and work emphases of KMb staff (Barwick et al., in press; Padek et al., 2015; Phipps and Morton, 2013; Schlierf and Meyer, 2013; Sharifi et al., 2014). This interest comes with criticism and demand that further refinement and clarity are needed regarding competencies. The hierarchy of competencies emerged from this study provides an alternative perspective to understanding and defining KMb practice across professions and domains, and suggests specific priorities for training and education.

Like Barwick et al.'s recent work on KTP practitioners in Canada (in press), this study surveyed KMb practitioners. As well, similar to Padek et al. (2015), KMb researchers were recruited for their expertise and perspective. Barwick and colleagues (in press) identified the competency themes of practice, project management, knowledge, social and networking, and intellectual property. They found that practitioners were keen to develop diverse "practice" skills. Alternatively, Padek and colleagues (2015) identified four different domains with 43 specific competencies. However, both studies do not employ a validated measure for competencies. The former's competency framework is broad, while the other is very specific. This study advances the KMb competency exploration by leveraging the Great Eight Competencies and UCF. The Great Eight Competencies clarify, pinpoint, and further organize KMb skills. As well, it provides us with an established method for further research and testing

into these workplace and core competencies that can span across various professions, domains, and contexts. It offers us a shared language to compare practices and competencies for the range of KMb work. Further, the study advances a broad hierarchy of competencies that will indeed require further refinement based on the nuances of KMb in practice.

From this study, a new question emerges and still remains: how might one develop these priority competencies? Indeed, Barwick et al. (in press), Padek et al. (2015), Straus et al. (2011), and others attempt to develop training targeting the competencies identified in their separate studies. However, there are differences between their lists of competencies, signaling further differentiation in what specific skills will be cultivated in each individual program. One can find the growing number of dissimilar lists and frameworks quite baffling; many claim to capture the core competencies for KMb. This study identifies four general approaches to KMb aligned with the Great Eight Competencies. It is expected that the training programs described by Barwick et al. (in press), Padek et al. (2015), and Straus et al. (2011) also correspond to specific KMb approaches and practices, as well as certain competencies in the UCF. However, presently, we lack this knowledge. Inspecting training initiatives, whether existing or in development, for their alignment with the UCF will help clarify training program distinctions for individuals seeking more training and support. For instance, it would be advantageous for practitioners, departments, and organizations to distinguish which programs cultivate and strengthen analytical skills, project management, or networking competencies. As Padek et al. (2015) discovered, KMb researchers identify many competencies as intermediate. How might one foster beginner competencies, let alone develop into an intermediate or expert practitioner? There is significant opportunity, as well as critical demand, to determine and demonstrate this progression.

Linking prioritized KMb competencies to performance

As the study respondents articulated, KMb initiatives differ in their project needs, established objectives, and anticipated outcomes. A range of professionals are tasked to perform diverse activities and employ various competencies and skills. As we see with the distinctions across the four viewpoints, KMb practitioners indeed focus, engage in, and prioritize particular competencies. Barwick et al. (in press) found that many current KMb practitioners desire more training and, further, can articulate the areas where they need further knowledge and skill development. Similarly, this study's respondents identified the activities and competencies they themselves deem as the most important. However, these perceptions have not been linked to the specifics of their individual practice – in particular, how effective they are in meeting the outcomes for their work. A critical area to investigate further is how to evaluate KMb practice and workplace performance. Employing the UCF will help us describe and illustrate KMb roles and responsibilities. Furthermore, the Great Eight Competencies can be used to help discuss and evaluate KMb workplace performance in a way that cuts across the wide range of KMb roles, as well as the diversity of professions, groups, organizations, and institutions engaged in this work.

This study captures four general approaches to KMb, but we still do not know the effectiveness of these approaches. As previous studies cross-examined practitioner perspectives with the viewpoints of end-users (von Essen & Sjöden, 1991) or managers (Turley and Bieman, 1995; Caldwell & O'Reilly III, 1990), it is critical to cross-examine these subjective viewpoints to the opinions of other stakeholders in the KMb process, as well as to tangible KMb outcomes and performance. How are these viewpoints and approaches related to specific KMb outcomes? How effective are these approaches in terms of meeting work objectives and project goals? Exploring these questions are important next steps. Certainly, it is crucial to determine if theory-

driven, relationship-focused, big picture-oriented, or product-focused activities, competencies, and approaches do indeed produce outcomes and results that meet stated goals, objectives, and needs.

Refining the list of priority competencies

Undeniably, this study provides only a small, empirical glimpse into the complex and complicated work of KMb. The study design itself enabled the collection of results from expert interviews, a Q-sort, an activity-rating task, as well as a range of open-ended responses concerning each participant's current KMb role and work context, training and education background, as well as definitions and explanations of KMb. As the literature develops around KMb competencies and as the field matures, there is potential in testing this preliminary hierarchy of competencies within specific contexts and comparing hierarchies across various professions and stakeholders. With nursing care behaviours and competencies, von Essen and Sjöden (1991) illustrate the fruitfulness of such a project. There is further opportunity to delve deeper into specific KMb roles. Relating to Caldwell and O'Reilly III's work (1990) on particular job tasks, competencies, and person-role fit, there is potential in exploring the nuances of particular KMb roles. For instance, the tasks of a university broker working with industry are different than those of a broker mediating between community groups for healthcare support services. Thus, the competencies they require to accomplish their work will differ accordingly. While competency frameworks often intentionally omit specific mentions of context-specific knowledge and skills (Bartram, 2005), this information is critical in order to understand KMb practice. Therefore, it is now imperative to cross-examine the Great Eight competencies, specifically, the hierarchy identified in this study, to particular settings. A second, follow-up Q-sort with these competencies rank-ordered from Most important to Most unimportant will also

enable further refinement. At the time of this paper's submission, preliminary plans have been made to bring this hierarchy of KMb competencies to specific KMb groups, including a group of university-based brokers, for discussion. Such work is crucial to validating and refining this study's exploratory findings.

Lastly, this study sought to recruit a diverse range of participants to see potential commonalities across various domains – while we can confirm that such commonality indeed exists, specificity will help to illuminate nuances in KMb practices and contexts. It would be advantageous to study KMb within a particular environment or organization (for instance, see Lindsey, 2003a, 2003b). Certainly, in investigating the organizational determinants and characteristics of KMb, Belkhodja et al. (2007) also examined individual workers tasked to this work. While this study emphasizes the latter, there is potential to further explore the organizational characteristics within the viewpoints, as the Q-survey respondents provided open-ended descriptions of their roles and the contexts in which they work. As Belkhodja and colleagues write, “Knowledge utilization . . . is affected not by determinants that are solely related to an individual perspective of study but by determinants that are as well inspired from an organizational perspective of study of the knowledge utilization phenomenon” (Belkhodja et al., 2007, p. 406-407). KMb practitioners, intermediaries, brokers, and researchers from diverse organizations, professions, disciplines, and domains are encouraged, now, to debate and critique the hierarchy of competencies developed here. It is through this dialogue and refinement that we will continue to clarify and illuminate the core competencies for KMb.

Appendices

Appendix A: *Email recruitment template – expert interviews*

Priority competencies and skills for knowledge mobilization: a Q-study

Dear _____,

My name is Monica Batac – I am a graduate student in the School of Professional Communication at Ryerson University (Toronto ON ,Canada). I am conducting a research project, under the supervision of Dr. Charles Davis, (Ryerson University) on core competencies and skills for knowledge mobilization. Ryerson University's Research Ethics Board has approved this study.

I am contacting you to ask you to participate in <<an in-person interview, focus group>> for this study. Potential participants for this stage of data collection are experts in knowledge mobilization, including researchers, brokers, and intermediaries. Your participation would be invaluable.

If you volunteer to participate in this study, you will be asked to participate in a short interview (25-40 minutes) to discuss your opinion on core skills and competencies for knowledge mobilization. Topics will include one's opinion on the most important skill sets, as well as profession or discipline-specific competencies.

OR

If you volunteer to participate in this study, you will be asked to participate in a small focus group (60-90 minutes), in a private boardroom, to discuss your opinion on core skills and competencies for knowledge mobilization. Topics will include one's opinion on the most important skill sets, as well as profession or discipline-specific competencies.

Your participation will help identify a list of core skills and competencies; this list will be incorporated into an online survey.

Please let me know if you would participate in this study. Please see the attached document for further information. I am happy to provide further information and answer any questions you may have.

You can contact me via email at monica.batac@ryerson.ca with any questions.

Thank you,

Monica Batac

Appendix B: *Interview Protocol for expert interviews*

1. Tell me about your role at _____ [as it relates to knowledge mobilization (KMb)].
2. How would you define KMb?
3. Tell me about the different users of knowledge.
4. Tell me about the differences across these groups in terms of KMb practices?
5. Tell me about the differences across these groups in terms of perspectives on KMb?
6. What would you consider to be the most important competencies or skills that an individual must develop when engaging in KMb?
7. Where might they learn or acquire these skills?
8. In your opinion, how would you describe the ideal KMb intermediary?

Appendix C: *Concourse development – expert interviewee demographics*

Gender	Number of participants
Male	5
Female	15
Total	20

Current country of residence	Number of participants
Canada	11
United Kingdom	9
Total	20

Highest level of education	Number of participants
Doctoral degree	13
Master's degree	6
Bachelor or Associate's Degree	1
Total	20

Years in postsecondary education	Number of participants
0-4	0
5-7	4
7+	16
Total	20

Years in professional practice	Number of participants
0-4	3
5-10	7
10+	10
Total	20

Field(s) of study	Former professions/roles
Anthropology Applied Social Research Biochemistry Biology Communication Education English Epidemiology Geography Gender studies Health Promotion Health and Social Care Health Services Research History Implementation Science International Development Library Science Management Medicine Nursing Policy studies Political Science Public Health Public policy Psychology Social policy Social work Sociology Speech Pathology Sports and health Town planning	Speech and language therapist Adult Nurse Clinical Forensic Psychologist Teacher HR consultant Communication officer Professional Writer Novelist Grant writer Magazine publisher/editor Professor (College, University) University researcher Community-based researcher Liaison Officer Project Coordinator Program manager Research coordinator Research and information officer Research assistant Senior Policy analyst Auditor Government advisor Consultant (development, government)

Current roles	Current work contexts
Director Independent consultant Knowledge Mobilization Officer/Lead/Coordinator/Specialist Manager PhD student Professor (Associate, Assistant, Full) Scientist Senior lecturer Research/Grant facilitator Research fellow Retired	Hospital University Intermediary organization Research institute (hospital, health, community)

Appendix D: Great Eight, 20 Competency Dimensions and 112 Competency Component Titles from the SHL Universal Competency Framework

1. Leading and Deciding			
Takes control and exercises leadership. Initiates action, gives direction, and takes responsibility			
1.1 Deciding & Initiating Action		1.2 Leading and Supervising	
Competency number	Component	Competency number	Component
1.1.1	Making decisions	1.2.1	Providing direction and coordinating action
1.1.2	Taking responsibility	1.2.	Supervising and monitoring behaviour
1.1.3	Acting with confidence	1.2.3	Coaching
1.1.4	Acting on own initiative	1.2.4	Delegating
1.1.5	Taking action	1.2.5	Empowering staff
1.1.6	Taking calculated risks	1.2.6	Motivating others
		1.2.7	Developing staff
		1.2.8	Identifying and recruiting talent

2. Supporting and Cooperating			
Supports others and shows respect and positive regard for them in social situations. Puts people first, working effectively with individuals and teams, clients, and staff. Behaves consistently with clear personal values that complement those of the organization			
2.1 Working with people		2.2 Adhering to principles and values	
Competency number	Component	Competency number	Component
2.1.1	Understanding others	2.2.1	Upholding ethics and values
2.1.2	Adapting to the team	2.2.2	Acting with integrity
2.1.3	Building team spirit	2.2.3	Utilizing diversity
2.1.4	Recognizing and rewarding contributions	2.2.4	Showing social and environmental responsibility
2.1.5	Listening		
2.1.6	Consulting others		
2.1.7	Communicating proactively		
2.1.8	Showing tolerance and consideration		
2.1.9	Showing empathy		
2.1.10	Supporting others		
2.1.11	Caring for others		
2.1.12	Developing and communicating self-knowledge and insight		

3. Interacting and presenting			
Communicates and networks effectively. Successfully persuades and influences others. Relates to others in a confident, relaxed manner.			
3.1 Relating and networking		3.2 Persuading and influencing	
Competency number	Component	Competency number	Component
3.1.1	Building rapport	3.2.1	Making an impact
3.1.2	Networking	3.2.2	Shaping conversations
3.1.3	Relating across levels	3.2.3	Appealing to emotions
3.1.4	Managing conflict	3.2.4	Promoting ideas
3.1.5	Using humor	3.2.5	Negotiating
		3.2.6	Gaining agreement
		3.2.7	Dealing with political issues
3.3 Presenting and communicating information			
Competency number	Component		
3.3.1	Speaking fluently		
3.3.2	Explaining concepts and opinions		
3.3.3	Articulating key points of an argument		
3.3.4	Presenting and public speaking		
3.3.5	Projecting credibility		
3.3.6	Responding to an audience		

4. Analyzing and interpreting			
Shows evidence of clear analytical thinking. Gets to the heart of complex problems and issues. Applies own expertise effectively.			
4.1 Writing and reporting		4.2 Applying expertise and technology	
Competency number	Component	Competency number	Component
4.1.1	Writing correctly	4.2.1	Applying technical expertise
4.1.2	Writing clearly and fluently	4.2.2	Building technical expertise
4.1.3	Writing in an expressive and engaging style	4.2.3	Sharing expertise
4.1.4	Targeting communication	4.2.4	Using technology resources
		4.2.5	Demonstrating physical and manual skills

4.2.6	Demonstrating cross functional awareness
4.2.7	Demonstrating spatial awareness

4.3 Analyzing	
Competency number	Component
4.3.1	Analyzing and evaluating information
4.3.2	Testing assumptions and investigating
4.3.3	Producing solutions
4.3.4	Making judgments
4.3.5	Demonstrating systems thinking

5. Creating and conceptualizing			
Works well in situations requiring openness to new ideas and experiences. Seeks out learning opportunities. Handles situations and problems with innovation and creativity. Thinks broadly and strategically. Supports and drives organizational change.			
5.1 Learning and researching		5.2 Creating and Innovating	
Competency number	Component	Competency number	Component
5.1.1	Learning quickly	5.2.1	Innovating
5.1.2	Gathering information	5.2.2	Seeking and introducing change
5.1.3	Thinking quickly		
5.1.4	Encouraging and supporting organizational learning		
5.1.5	Managing knowledge		

5.3 Formulating strategies and concepts	
Competency number	Component
5.3.1	Thinking broadly
5.3.2	Approaching work strategically
5.3.3	Setting and developing strategy
5.3.4	Visioning

6. Organizing and executing			
Plans ahead and works in a systematic and organized way. Follows directions and procedures. Focuses on customer satisfaction and delivers a quality service or product to the agreed standards.			
6.1 Planning and organizing		6.2 Delivering results and meeting customer expectations	
Competency number	Component	Competency number	Component
6.1.1	Setting objectives	6.2.1	Focusing on customer needs and satisfaction
6.1.2	Planning	6.2.2	Setting high standards for quality
6.1.3	Managing time	6.2.3	Monitoring and maintaining quality
6.1.4	Managing resources	6.2.4	Working systematically
6.1.5	Monitoring progress	6.2.5	Maintaining quality processes
		6.2.6	Maintaining productivity levels
		6.2.7	Driving projects to results
6.3 Following instructions and procedures			
Competency number	Component		
6.3.1	Following directions		
6.3.2	Following procedures		
6.3.3	Time keeping and attending		
6.3.4	Demonstrating commitment		
6.3.5	Showing awareness of safety issues		
6.3.6	Complying with legal obligations		

7. Adapting and coping			
Adapts and responds well to change. Manages pressure effectively and copes well with setbacks.			
7.1 Adapting and responding to change		7.2 Coping with pressure and setbacks	
Competency number	Component	Competency number	Component
7.1.1	Adapting	7.2.1	Coping with pressure
7.1.2	Accepting new ideas	7.2.2	Showing emotional self-control
7.1.3	Adapting interpersonal style	7.2.3	Balancing work and personal life
7.1.4	Showing cross-cultural awareness	7.2.4	Maintaining a positive outlook
7.1.5	Dealing with ambiguity	7.2.5	Handling criticism

8. Enterprising and performing			
Focuses on results and achieving personal work objectives. Works best when work is related closely to results and the impact of personal efforts is obvious. Shows an understanding of business, commerce, and finance. Seeks opportunities for self-development and career advancement.			
8.1 Achieving personal work goals and objectives		8.2 Entrepreneurial and commercial thinking	
Competency number	Component	Competency number	Component
8.1.1	Achieving work objectives	8.2.1	Monitoring markets and competitors
8.1.2	Working energetically and enthusiastically	8.2.2	Identifying business opportunities
8.1.3	Pursuing self-development	8.2.3	Demonstrating financial awareness
8.1.4	Demonstrating ambition	8.2.4	Controlling costs
		8.2.5	Keeping aware of organizational issues

Adapted from Bartram, 2005, p. 1202-1203

Appendix E: Q Sample, complete

Statement 1	KMb is less about theory and more about making things happen.
Statement 2	You need to find that ‘trigger’ that will motivate people to do something.
Statement 3	We need to build a culture that recognizes why using evidence is important.
Statement 4	One can be strategic by showing researchers other ways of operating beyond traditional dissemination.
Statement 5	Complex societal problems require everyone’s skills - all hands on deck.
Statement 6	We’re watchers and analyzers, but most of all we’re do-ers.
Statement 7	It's about seeking to understand first before trying to be understood.
Statement 8	Wrapped around the rhetoric of KMb are some very clear social justice and ethical arguments.
Statement 9	KMb is much more a dialogue process, rather than didactic.
Statement 10	We need to understand our audience and speak to them, not at them.
Statement 11	KMb is about making the world a better place by making better decisions.
Statement 12	Respect, empathy, and humility are all essential when doing KMb.
Statement 13	KMb is marketing for academics; we take what they have to say and spread that message.
Statement 14	You need to be involved in a system in a practice sense or else you don’t have the authority for KMb.
Statement 15	This is not a job for a backroom person.
Statement 16	The most effective people in KMb know how to build and establish relationships and networks.
Statement 17	Fundamentally, you need a skill in having conversations.
Statement 18	We move knowledge into action through powerful communications - words, images, films, all sorts of channels.
Statement 19	Writing skills are critical - friendly language, brief, concise, short.
Statement 20	KMb works best when you have a team of people working together on a goal.

Statement 21	We need system thinkers.
Statement 22	We need to spend more time studying the uptake and usefulness of our KMb products and networks.
Statement 23	The skills I use on an everyday basis I learned in high school.
Statement 24	To say that it's a mechanical job, no. Are parts of it mechanical? Absolutely.
Statement 25	You need to be a boundary spanner.
Statement 26	If we don't know what works, then we have to experiment!
Statement 27	You need to cultivate the ability to go into a situation and see what's going on.
Statement 28	If you wait for the perfect strategy for practice or policy change, you'll be waiting forever!
Statement 29	The skills you need really depends on the role you play in the system of KMb.
Statement 30	Sure, it's important to create KMb products, but you need to embed them in networked approaches.
Statement 31	Two words: project management.
Statement 32	There's a whole unglamorous side to this work: it's secretarial, administrative, logistics.
Statement 33	Using the Knowledge to Action (or another framework) is important.
Statement 34	One must have a deep understanding and expertise in conducting research.
Statement 35	Evaluating effectiveness and impact is so important.
Statement 36	A lot of people try to bring about change but they don't understand the organization.
Statement 37	You have to be comfortable with ambiguity.
Statement 38	There is no one size fits all approach to KMb.
Statement 39	In terms of skills, the most important one is having that ability to morph.
Statement 40	KMb occurs in a space full of conflict and tension – It's not always happy go-lucky.
Statement 41	I have to be receptive - If I am too enthusiastic, too intense, too driven, too passionate, it can put people off.

Statement 42	The general public is skeptical about research and researchers - KMb tries to mend this.
Statement 43	My training in KMb has been piecemeal – nothing was the right fit but I made it work for my needs.
Statement 44	There's a need for a professional body to bring KMb people together and sets industry standards.
Statement 45	Now that brokering is seen as a hot topic, people seem to think that anyone can get into this line of work.
Statement 46	Investing in events and networks for KMb is very expensive but are arguably the highest yield strategies.
Statement 47	Everyone in KMb is product-focused because that's much easier and cheaper to do.
Statement 48	Things change so much, you need to have the skills to reflect on what you're doing and what's missing.
Statement 49	People wrongly exclude technology transfer and commercialization from KMb - it is definitely part of KMb.

Appendix F: *Q Sample, organized using Great 8 Competencies*

1. Leading and Deciding

- Takes control and exercises leadership. Initiates action, gives direction, and takes responsibility

Competency number	Component	Statement	Number
1.1.5	Taking action	KMb is less about theory and more about making things happen.	1
1.2.6	Motivating others	You need to find that 'trigger' that will motivate people to do something.	2
1.2.5	Empowering others	We need to build a culture that recognizes why using evidence is important.	3
1.2.3	Coaching	One can be strategic by showing researchers other ways of operating beyond traditional dissemination	4
1.2.1	Providing direction and coordinating action	Complex societal problems require everyone's skills - all hands on deck.	5
1.1.4	Acting on own initiative	We're watchers and analyzers, but most of all we're do-ers.	6

2. Supporting and Cooperating

- Supports others and shows respect and positive regard for them in social situations. Puts people first, working effectively with individuals and teams, clients, and staff. Behaves consistently with clear personal values that complement those of the organization

Competency number	Component	Statement	Number
2.1.1	Understanding others	It's about seeking to understand first before trying to be understood.	7
2.2.4	Showing social and environmental responsibility	Wrapped around the rhetoric of KMb are some very clear social justice and ethical arguments.	8
2.1.6	Consulting others	KMb is much more a dialogue process, rather than didactic.	9
2.1.5	Listening	We need to understand our audience and speak with them, not at them.	10
2.2.1	Upholding ethics and values	KMb is about making the world a better place by making better decisions.	11
2.1.9	Showing empathy	Respect, empathy, and humility are all essential when doing KMb.	12

3. Interacting and Presenting

- Communicates and networks effectively. Successfully persuades and influences others. Relates to others in a confident, relaxed manner.

Competency number	Component	Statement	Number
3.2.4	Promoting ideas	KMb is marketing for academics; we take what they have to say and spread that message.	13
3.3.5	Projecting credibility	You need to be involved in a system in a practice sense or else you don't have the authority for KMb.	14
3.3.4	Presenting and public speaking	This is not a job for a backroom person.	15
3.1.2	Networking	The most effective people in KMb know how to build and establish relationships and networks.	16
3.2.2	Shaping conversations	Fundamentally, you need a skill in having conversations.	17
3.3.4	Presenting and public speaking	We move knowledge into action through powerful communications - words, images, films, all sorts of channels.	18

4. Analyzing and Interpreting

-Shows evidence of clear analytical thinking. Gets to the heart of complex problems and issues. Applies own expertise effectively.

Competency number	Component	Statement	Number
4.1.2	Writing clearly and fluently	Writing skills are critical - friendly language, brief, concise, short.	19
4.2.6	Demonstrating cross functional awareness	KMb works best when you have a team of people working together on a goal.	20
4.3.5	Demonstrating systems thinking	We need system thinkers.	21
4.3.2	Testing assumptions and investigating	We need to spend more time studying the uptake and usefulness of our KMb products and networks.	22
4.2.2	Building technical expertise	The skills I use on an everyday basis I learned in high school.	23
4.2.2	Building technical expertise	To say that it's a mechanical job, no. Are parts of it mechanical? Absolutely.	24

5. Creating and Conceptualizing

- Works well in situations requiring openness to new ideas and experiences. Seeks out learning opportunities. Handles situations and problems with innovation and creativity. Thinks broadly and strategically. Supports and drives organizational change

Competency number	Component	Statement	Number
5.3.2	Approaching work strategically	You need to be a boundary spanner.	25
5.2.2	Seeking and introducing change	If we don't know what works, then we have to experiment!	26
5.1.2	Gathering information	You need to cultivate the ability to go into a situation and see what's going on.	27
5.2.1	Innovating	If you wait for the perfect strategy for practice or policy change, you'll be waiting forever!	28
5.3.1	Thinking broadly	The skills you need really depends on the role you play in the system of KMb.	29
5.1.4	Encouraging and supporting organizational learning	Sure, it's important to create KMb products, but you need to embed them in networked approaches.	30

6. Organizing and Executing

-Works well in situations requiring openness to new ideas and experiences. Seeks out learning opportunities. Handles situations and problems with innovation and creativity. Thinks broadly and strategically. Supports and drives organizational change.

Competency number	Component	Statement	Number
6.1.5	Monitoring progress	Two words: project management.	31
6.1.2	Planning	There's a whole unglamorous side to this work: it's secretarial, administrative, logistics.	32
6.2.4	Working systematically	Using the Knowledge to Action (or another framework) is important.	33
6.2.2.	Setting high standards for quality	One must have a deep understanding and expertise in conducting research.	34
6.2.3	Monitoring and maintaining quality	Evaluating effectiveness and impact is so important.	35
6.2.1	Focusing on customer needs and satisfaction	A lot of people try to bring about change but they don't understand the organization	36

7. Adapting and Coping

-Adapts and responds well to change. Manages pressure effectively and copes well with setbacks

Competency number	Component	Statement	Number
7.1.5	Dealing with ambiguity	You have to be comfortable with ambiguity.	37
7.1.1	Adapting	There is no one size fits all approach to KMb.	38
7.1.1	Adapting	In terms of skills, the most important one is having that ability to morph.	39
7.2.1	Coping with pressure	KMb occurs in a space full of conflict and tension – It's not always happy go-lucky.	40
7.1.3	Adapting interpersonal style	I have to be receptive - If I am too enthusiastic, too intense, too driven, too passionate, it can put people off.	41
7.2.5	Handling criticism	The general public is skeptical about research and researchers - KMb tries to mend this.	42

8. Enterprising and Performing

-Focuses on results and achieving personal work objectives. Works best when work is related closely to results and the impact of personal efforts is obvious. Shows an understanding of business, commerce, and finance. Seeks opportunities for self-development and career advancement.

Competency number	Component	Statement	Number
8.1.3	Pursuing self-development	My training in KMb has been piecemeal – nothing was the right fit but I made it work for my needs.	43
8.1.3	Pursuing self-development	There's a need for a professional body to bring KMb people together and sets industry standards.	44
8.2.1	Monitoring markets and competitors	Now that brokering is seen as a hot topic, people seem to think that anyone can get into this line of work.	45
8.2.3	Demonstrating financial awareness	Investing in events and networks for KMb is very expensive but are arguably the highest yield strategies.	46
8.2.3	Demonstrating financial awareness	Everyone in KMb is product-focused because that's much easier and cheaper to do.	47
8.1.4	Demonstrating ambition	Things change so much, you need to have the skills to reflect on what you're doing and what's missing.	48
8.2.2	Identifying business opportunities	People wrongly exclude technology transfer and commercialization from KMb - it is definitely part of KMb.	49

Appendix G: *List of Activities for Rating with corresponding Great Eight Competency and component*

Question number	Activity*	Competency and component
DOMAIN: Leading and Deciding		
10	Acting on your own initiative	1.1.4
11	Providing direction and/or coordination for KMb projects	1.2.1
12	Coaching others	1.2.3
DOMAIN: Supporting and Cooperating		
13	Adapting to the target audience	2.1.2
14	Co-designing or co-producing research and/or implementation plans and initiatives	2.1.6
15	Upholding ethical values of the organization/profession	2.2.1
DOMAIN: Interacting and Presenting		
16	Networking with existing or potential partners	3.1.1
17	Facilitating conversations between groups	3.2.2
18	Explaining ideas or concepts to various groups	3.2.2
DOMAIN: Analyzing and interpreting		
19	Translating research into plain language/accessible formats	4.1.2
20	Building technical expertise	4.2.2
21	Analyzing and evaluating research	4.3.1
22	Evaluating communication plans	4.3.1
23	Providing support or strategy at system-level	4.3.5
DOMAIN: Creating and conceptualizing		
24	Managing knowledge	5.1.5
25	Innovating	5.2.1
26	Seeking and/or introducing practice/policy change	5.2.2
27	Building strategic partnerships	5.3.2
28	Setting and developing strategies for large scale initiatives	5.3.3
DOMAIN: Organizing and executing		
29	Setting project objectives	6.1.1
30	Project management	6.1 - all
31	Focusing on stakeholder needs and satisfaction	6.2.1
32	Driving projects to results	6.2.7
DOMAIN: Adapting and coping		
33	Accepting new ideas	7.1.2
34	Dealing with ambiguity	7.1.5
35	Coping with pressure	7.2.1
36	Handling criticism	7.2.5
DOMAIN: Enterprising and performing		
37	Achieving personal work objectives	8.1.1

38	Participating in ongoing professional development	8.1.3
39	Identifying business opportunities	8.2.2
40	Supporting technology transfer and/or commercialization	8.2.2
41	Identifying organizational issues	8.2.5
<p>*Activities were rated on a five-point Likert scale:</p> <ol style="list-style-type: none"> 1. Extremely important 2. Quite important 3. Somewhat important 4. Hardly important 5. Not at all important 		

Appendix H: *Q* Sort Scoring Sheet

Most Disagree

Most Agree

[illegible]

Appendix I: *Q-Survey Protocol*

INTRODUCTION

This study seeks to learn more about knowledge mobilization practices, and the core competencies and skills needed for this work.

The study will provide knowledge mobilization researchers, brokers, intermediaries, and practitioners with the opportunity to share their opinions about core competencies, skills, and activities.

The results will contribute to a Master's Research Paper, as well as conference presentations and publications. This research is being conducted by Monica Batac, as part of a Master's Research Project, under the supervision of Dr. Charles Davis at Ryerson University.

The survey should take you about 30 minutes to complete.

INSTRUCTIONS

Step 1: Reading the statements

In a moment, you will be shown a set of statements on 49 "cards". These statements are things people have said about knowledge mobilization. Later on, we will ask you to what extent you agree or disagree with these statements.

Read the following statements carefully and split them up into three piles: on your right a pile for statements you tend to agree with, on your left a pile for statements you tend to disagree with, and a pile in the middle for the rest. If you don't understand what the statement refers to or feel that it doesn't apply to you, or have no strong feelings either way, you should place it in the 'neutral/don't know/not applicable' pile.

You can either drag the cards into one of the three piles or press 1, 2, 3 (not too fast please!!) on your keyboard. Changes can be made later.

Important: If you want to read these instructions again, press the help-button at the bottom right corner. Please do NOT press the Back button in your browser.

Please complete the survey in one sitting, since your responses cannot be saved.

Step 2: Ranking the statements

Take the cards from the "AGREE" pile and read them again. You can scroll through the statements by using the scroll bar. Next, select the two statements you MOST AGREE with and place them on the RIGHT side of the score sheet below the "+5".

Now read the cards in the "DISAGREE" pile again. As before, select the two statements you MOST DISAGREE with and place them on the LEFT side of the score sheet below the "-5".

Next, select the statements you second most agree/disagree with and place them in columns, under "+4"/"-4". Follow this procedure for all cards in the "AGREE" and "DISAGREE" piles.

Finally, read the "NEUTRAL" cards again and arrange them in the remaining open boxes of the score sheet. You will be able to change the position of any cards later, if you wish.

Don't worry if some 'neutral' statements have to be placed in the other columns. Just fill the spaces in the middle as you see fit.

To enlarge the card window, click on the scroll bar on the left side. If you want to read these instructions again, press the help-button at the bottom right corner.

Step 3: Checking the ranking

Now that you have placed all cards on the score sheet, please go over your distribution once more and shift the cards around if you want to. The full text of each statement will re-appear as you scroll the mouse over each card. You can shift the cards by clicking and dragging them to the space you wish to move them to. Please click 'help me' if you wish to see these instructions again.

Step 4: Explaining the ranking

Please explain why you agree most or disagree most with the following statements you have placed in the columns below "+5" or "-5".

Step 5: Some final questions

Finally, please answer the following questions regarding your specific work, context, and background.

You will also be asked to rate 30 KMb activities - this rating activity can be done quickly.

About the statements you just sorted

1. To what extent did the statements provided in the previous ranking exercise allow you to express your own understanding of and experiences with Knowledge Mobilization (KMb)?

- Not at all. None of the statements really reflected my perspective and KMb practice
- To a limited extent. Other important aspects weren't covered, though
- Generally. I could express much of my perspective using the statements provided, but not fully
- Almost completely. I was able to communicate my response very effectively through the ranking process

2. If you don't feel you have fully expressed your own perspective of KMb in the previous ranking exercise, please describe it here.

About your practice

3. Out of the numerous terms for KMb, which one resonates most with you? Why? (for example, other terms include research utilization, knowledge translation, knowledge transfer, knowledge exchange, extension, dissemination, diffusion, implementation science, etc.

4. What does knowledge mobilization mean to you?

5. How did you first hear about KMb?

6. How did you first get involved with KMb?

7. What sorts of education/training/professional development have you undertaken that have been valuable to your KMb work?

8. Which conferences do you attend to learn about/discuss KMb?

9. Of the various professional/academic associations you may belong to, which ones have explicit/dedicated interest or focus on KMb?

About your KMb activities - please rank each activity in terms of importance

10. Acting on your own initiative?

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

11. Providing direction and/or coordination for KMb projects?

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

12. Coaching others?

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

13. Adapting to the target audience?

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

14. Co-designing or co-producing research and/or implementation plans and initiatives

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

15. Upholding ethical values of the organization/profession

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

16. Networking with existing or potential partners

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

17. Facilitating conversations between different groups

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

18. Explaining ideas and concepts to various groups

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

19. Translating research into plain language/accessible formats

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

20. Building technical expertise

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

21. Analyzing and evaluating research

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

22. Evaluating communication plans

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

23. Providing support or strategy at system-level

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

24. Managing knowledge

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

25. Innovating

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

26. Seeking and/or introducing practice/policy change

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

27. Building strategic partnerships

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

28. Setting and developing strategies for large scale initiatives

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

29. Setting project objectives

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

30. Project management

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

31. Focusing on stakeholder needs and satisfaction

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

32. Driving projects to results

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

33. Accepting new ideas

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

34. Dealing with ambiguity

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

35. Coping with pressure

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

36. Handling criticism

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

37. Achieving personal work objectives

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

38. Participating in ongoing professional development

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

39. Identifying business opportunities

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

40. Supporting technology transfer and/or commercialization

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

41. Identifying organizational issues

Extremely important; Quite important; Somewhat important; Hardly important; Not at all important

About you

42. Please enter your age: (for example, 24)

43. Please select your gender:

Female; Male

44. What is your nationality?

45. What is your present country of residence?

46. What is your current role?

47. Describe your current role.

48. In what field or profession do you work?</note>

49. In what kind of organization or institution do you work?

50. What is your highest level of education?

Doctoral degree; Masters degree; Bachelors degree; Professional qualification; Baccalaureate or A-levels; University entrance; High school diploma or leaving certificate; I did not complete secondary/high school

Is there anything else you would like to say about KMb that hasn't been addressed in the survey?

If you are willing to be contacted by us about your responses to this study, please leave your email address here:

Thank you for completing our survey.

Appendix J: *Template for List-Serv or organization-supported recruitment email*

Dear <<listserv name>> community,

My name is Monica Batac – I am a graduate student in the School of Professional Communication at Ryerson University (Toronto ON, Canada). I am conducting a research project, under the supervision of Dr. Charles Davis (Ryerson University), on priority activities for knowledge mobilization, and the competencies and skills required for this work. This study has been approved by Ryerson University's Research Ethics Board.

I am looking for a diverse group of participants to complete the online survey (Q-Sort). Potential participants include knowledge mobilization researchers, knowledge brokers, intermediaries, and practitioners.

What you will be asked to do:

This study asks you to read, sort, and rank-order statements about knowledge mobilization. Once the survey is complete, you will be asked to share your sorting rationale. As well, you will be asked to rate a set of activities in terms of importance and provide contextual information about your work. You will be presented with the option to share your contact information for further follow-up.

The survey can be found at: <link>

Your choice of whether or not to participate will not influence your future relations with me or Ryerson University.

Please feel free to forward this recruitment email to those who may like to participate.

Should you have any questions about this project, please feel free to email me at monica.batac@ryerson.ca

Warm regards,

Monica Batac
Master of Professional Communication Candidate
School of Professional Communication

Appendix K: Preliminary breakdown of Q-survey respondent demographics

Gender	Number of participants
Male	27
Female	61
No answer	3
Total	91

Nationality	Number of participants
Canada	59 (one dual)
United Kingdom	18 (one dual)
USA	2
Venezuela	2
Columbia	1
Cameroon	1
Netherlands	1
Germany	1
Greece	1
China	1
Korea	1
New Zealand	1
Switzerland	1
Unknown	2
Total	91* *Note: 92 with one dual citizen

Current country of residence	Number of participants
Canada	62
United Kingdom	16
Denmark	1
Cameroon	1
France	1
Germany	1
Greece	1
Netherlands	2
New Zealand	1
South Africa	1
United States of America	1
Venezuela	2
Unknown	1
Total	91

Highest level of education	Number of participants
Doctoral degree	34
Master's degree	43
Bachelor or Associate's Degree	10
Professional qualification	1
Baccalaureate or A-levels;	0
University entrance	0
High school diploma or leaving certificate	1
I did not complete secondary/high school	0
Unknown	2
Total	91

Current role	Number of participants
KMb Coordinator/Lead	17
Knowledge Broker	12
Researcher or research fellow	9
Project or Program Manager	9
Independent consultant	6
KMb specialist	5
Executive Director/Director	5
PhD/Master's student	4
Professor (Full, Associate, Assistant)	3
Research/Impact/Grant development officer	3
Research Coordinator	3
Research Administrator	1
Research Associate	1
Psychologist	1
Social worker	1
Nurse Clinician	1
Research Communicator	1
Training specialist	1
Library Services Manager	1
Senior Analyst	1
Communication Manager	1
Retired	2
Unknown	3
Total	91

Appendix L: Q Sort Results

64 of 91 sorts were accounted for in 4 factors.

Factor (viewpoint)	Number of significant sorts
A	2, 6, 7, 23, 30, 35, 37, 40, 58, 59, 61, 76, 78, 82, 84, 88
B	5, 11, 28, 29, 33, 36, 48, 52, 53, 60, 64, 66, 69, 73, 75, 86
C	10, 13, 14, 15, 16, 21, 25, 31, 51, 56, 67, 68, 72, 77, 91
D	1, 3, 8, 19, 26, 27, 32, 34, 39, 42, 44, 49, 70, 74, 79, 85, 87
Other sorts	Number
Confounded	4, 12, 18, 20, 41, 47, 54, 55, 57, 65, 71, 81, 89
Not significant	9, 17, 22, 24, 38, 43, 45, 46, 50, 62, 63, 80, 83, 90
Total sorts	91

Q-sort results

Statement	Score for each viewpoint*			
	A	B	C	D
1. KMb is less about theory and more about making things happen.	-5	-1	-3	0
2. You need to find that ‘trigger’ that will motivate people to do something.	3	3	-1	1
3. We need to build a culture that recognizes why using evidence is important.	4	1	1	4
4. One can be strategic by showing researchers other ways of operating beyond traditional dissemination.	3	0	-1	2
5. Complex societal problems require everyone’s skills - all hands on deck.	1	0	1	-1
6. We’re watchers and analyzers, but most of all we’re do-ers.	0	1	-2	2
7. It's about seeking to understand first before trying to be understood.	0	5	2	-2
8. Wrapped around the rhetoric of KMb are some very clear social justice and ethical arguments.	-1	2	0	-4
9. KMb is much more a dialogue process, rather than didactic.	1	4	4	0
10. We need to understand our audience and speak to them, not	3	5	5	3

at them.				
11. KMb is about making the world a better place by making better decisions.	2	0	-3	3
12. Respect, empathy, and humility are all essential when doing KMb.	1	5	1	0
13. KMb is marketing for academics; we take what they have to say and spread that message.	-4	-5	-5	-5
14. You need to be involved in a system in a practice sense or else you don't have the authority for KMb.	-4	-5	-3	-5
15. This is not a job for a backroom person.	-3	-3	-4	-1
16. The most effective people in KMb know how to build and establish relationships and networks.	5	4	-1	5
17. Fundamentally, you need a skill in having conversations.	1	3	0	1
18. We move knowledge into action through powerful communications - words, images, films, all sorts of channels.	-1	2	-2	5
19. Writing skills are critical - friendly language, brief, concise, short.	2	2	0	4
20. KMb works best when you have a team of people working together on a goal.	-1	0	3	3
21. We need system thinkers.	4	-4	4	0
22. We need to spend more time studying the uptake and usefulness of our KMb products and networks.	5	0	3	2
23. The skills I use on an everyday basis I learned in high school.	-5	-5	-5	-5
24. To say that it's a mechanical job, no. Are parts of it mechanical? Absolutely.	-3	-2	0	-3
25. You need to be a boundary spanner.	1	-1	3	-1
26. If we don't know what works, then we have to experiment!	0	1	0	0
27. You need to cultivate the ability to go into a situation and see what's going on.	2	4	3	3
28. If you wait for the perfect strategy for practice or policy change, you'll be waiting forever!	0	3	2	1
29. The skills you need really depends on the role you play in the system of KMb.	-2	0	5	4
30. Sure, it's important to create KMb products, but you need to embed them in networked approaches.	4	-1	1	2
31. Two words: project management.	0	-2	-2	-1
32. There's a whole unglamorous side to this work: it's secretarial, administrative, logistics.	-2	-1	4	1
33. Using the Knowledge to Action (or another framework) is important.	4	-2	0	-2
34. One must have a deep understanding and expertise in conducting research.	-2	-4	-4	-1

35. Evaluating effectiveness and impact is so important.	5	2	4	4
36. A lot of people try to bring about change but they don't understand the organization.	2	4	-2	-3
37. You have to be comfortable with ambiguity.	-1	1	2	1
38. There is no one size fits all approach to KMb.	3	3	5	5
39. In terms of skills, the most important one is having that ability to morph.	-3	1	-1	-3
40. KMb occurs in a space full of conflict and tension – It's not always happy go-lucky.	-2	0	2	-2
41. I have to be receptive - If I am too enthusiastic, too intense, too driven, too passionate, it can put people off.	-2	-2	-2	-2
42. The general public is skeptical about research and researchers - KMb tries to mend this.	-4	-3	-3	-3
43. My training in KMb has been piecemeal – nothing was the right fit but I made it work for my needs.	-3	-2	1	0
44. There's a need for a professional body to bring KMb people together and sets industry standards.	0	-3	-5	-4
45. Now that brokering is seen as a hot topic, people seem to think that anyone can get into this line of work.	0	-3	-4	-4
46. Investing in events and networks for KMb is very expensive but are arguably the highest yield strategies.	-4	-4	2	0
47. Everyone in KMb is product-focused because that's much easier and cheaper to do.	-5	-4	-4	-4
48. Things change so much, you need to have the skills to reflect on what you're doing and what's missing.	2	2	0	2
49. People wrongly exclude technology transfer and commercialization from KMb - it is definitely part of KMb.	-1	-1	-1	-2

Scores range from -5 to 5

Appendix M: Significant Loadings for each Viewpoint

Significant Loadings for Viewpoint A

Sort	Load	Sort	Load
2	0.53	58	0.56
6	0.62	59	0.54
7	0.50	61	0.46
23	0.63	76	0.48
30	0.45	78	0.59
35	0.60	82	0.50
37	0.58	84	0.49
40	0.68	88	0.44

Significant Loadings for Viewpoint B

Sort	Load	Sort	Load
5	0.52	53	0.41
11	0.41	60	0.59
28	0.45	64	0.55
29	0.59	66	0.45
33	0.60	69	0.55
36	0.42	73	0.52
48	0.60	75	0.41
52	0.64	86	0.51

Significant Loadings for Viewpoint C

Sort	Load	Sort	Load
10	0.47	31	0.40
13	0.43	51	0.45
14	0.53	56	0.44
15	0.58	67	0.70
16	0.56	68	0.43
21	0.66	72	0.42
25	0.64	77	0.42
		91	0.38

Significant Loadings for Viewpoint D

Sort	Load	Sort	Load
1	0.53	39	0.50
3	0.43	42	0.44
8	0.59	44	0.55
19	0.46	49	0.58
26	0.41	70	0.42
27	0.42	74	0.59
32	0.54	79	0.48
34	0.48	85	0.47
		87	0.50

Appendix N: Average scores for competencies

Q-sort average scores* across the Great Eight Competencies by Viewpoint

Viewpoint	Leading and Deciding	Supporting and Cooperating	Interacting and Presenting	Analyzing and Interpreting	Creating and Conceptualizing	Organizing and Executing	Adapting and Coping	Enterprising and Performing
A	6.50	6.74	5.42	6.13	6.63	6.80	5.09	4.88
B	6.45	8.00	5.75	5.19	6.54	5.67	5.95	4.68
C	5.86	7.08	4.41	6.24	7.47	5.76	6.21	5.12
D	6.82	6.00	6.32	5.96	6.81	5.64	5.56	5.04

*Scores range from 1 (Least Agree) to 11 (Most Agree)

Rating Activity average scores* across the Great Eight Competencies by Viewpoint

Competency	Viewpoint			
	A	B	C	D
Leading and Deciding	2.04	1.69	1.98	1.69
Supporting and Cooperating	1.59	1.52	1.55	1.88
Interacting and Presenting	1.67	1.67	1.81	1.73
Analyzing and Interpreting	1.93	2.16	2.23	1.99
Creating and Conceptualizing	2.02	1.89	1.91	1.89
Organizing and Executing	1.69	1.78	1.85	1.99
Adapting and Coping	2.23	1.75	1.97	1.91
Enterprising and Performing	2.31	2.45	2.43	2.54

*Score range from 1 (Most Important) to 5 (Not at all Important)

Appendix O: Average scores across KMb competencies

	Viewpoints				Average across all Viewpoints
	A	B	C	D	
Supporting and Cooperating	1.59	1.52	1.55	1.88	1.63
Interacting and Presenting	1.67	1.67	1.81	1.73	1.75
Organizing and Executing	1.69	1.78	1.85	1.99	1.90
Leading and Deciding	2.04	1.69	1.98	1.69	1.91
Creating and Conceptualizing	2.02	1.89	1.91	1.89	1.96
Adapting and Coping	2.23	1.75	1.97	1.91	2.03
Analyzing and Interpreting B (System-level thinking only)	1.87	2.60	1.80	2.12	2.09
Analyzing and Interpreting A	1.95	2.04	2.37	1.97	2.17
Enterprising and Performing	2.31	2.45	2.43	2.54	2.49
Five-point Likert scale used, 1 (Most important) to 5 (Not at all important)					

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