KNOWLEDGE MOBILIZATION AND RESEARCH IMPACT IN CANADIAN UNIVERSITIES: A DEVELOPMENTAL EVALUATION OF NETWORK LEARNING

by

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Abstract

In Canada and abroad, governments and research funders are increasing expectations that researchers engage in knowledge mobilization (KMb) efforts to advance the impacts of research. However, despite this growing pressure, researchers and universities are struggling to build their KMb capacity. This dissertation aims to contribute to the research and practice of KMb by investigating the experiences and perspectives university-embedded professional staff who operationalize KMb as well as their professional networks that build KMb capacity at scale. Developmental evaluation (DE) provides the overarching design of this study, and the participants were members of Research Impact Canada (RIC).

A multi-manuscript format is used to organize this dissertation reflecting one study with three phases. The first paper corresponds to Phase I of the DE and presents survey findings from 16 RIC leaders, representing 14 networked universities, about the usefulness and use of network learning to build institutional KMb capacity. The second paper corresponds to Phase II of the DE and presents the findings from semi-structured interviews with 20 key informants from 17 RIC member institutions regarding network learning and how it could be structured to improve the disconnect between KMb theory and practice. The third paper combines the findings from Phases I and II of the DE and merges key insights with practitioner narratives from four experienced RIC members, focusing on how the lessons learned from RIC provide insight into how universities can foster active engagement in KMb. The final paper presents an overview of quantitative measurement tools for the impacts of co-production, which developed in response to an identified problem of practice for KMb professionals.

Collectively, the findings from these papers elucidate the potential of network learning to build institutional KMb capacity, while acknowledging that such efforts require attention to (a)
the diversity of individual and institutional practices; (b) tensions that can simultaneously spell network fragmentation or a generative learning environment; and (c) enduring questions for the field of KMb; and (d) how a necessary complement to KMb efforts will require engaging more openly and critically with psychometric and pragmatic considerations when designing, implementing, and reporting on research impact measurement tools.
Co-Authorship

This thesis follows a manuscript-style format in accordance with the guidelines of the Faculty of Education and the School of Graduate Studies at Queen’s University. I would like to acknowledge the contributors for studies in Chapters 2, 3, and 4.


**Chapter 4: MacGregor, S., Phipps, J., Edwards, C. M., Portes, V, & Kyffin, J. (under review following revisions).** Fostering active engagement in knowledge mobilization: The role of higher education institutions. *Canadian Journal of Higher Education.*
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<th>Full Form</th>
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<tbody>
<tr>
<td>CIHR</td>
<td>Canadian Institutes of Health Research</td>
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<td>DE</td>
<td>Developmental evaluation</td>
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<td>FHSS</td>
<td>Federation for the Humanities and Social Sciences</td>
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<td>HEI</td>
<td>Higher education institution</td>
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<td>KEF</td>
<td>Knowledge Exchange Framework</td>
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<td>KMb</td>
<td>Knowledge mobilization</td>
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<td>NSERC</td>
<td>Natural Sciences and Engineering Research Council</td>
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<td>REF</td>
<td>Research Excellence Framework</td>
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<td>RIC</td>
<td>Research Impact Canada</td>
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<td>SNA</td>
<td>Social network analysis</td>
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<td>SSHRC</td>
<td>Social Sciences and Humanities Research Council of Canada</td>
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Chapter 1

Introduction

In 2020, Canada spent 37.4 billion dollars on research and development, with 23.8% financed by the federal and provincial governments through the allocation of public tax dollars (Statistics Canada, 2021). Despite this major public investment, research often fails to realize its potential impacts within public service sectors (Davies et al., 2019; Nutley et al., 2007). In education, for example, scholars have found that not only is research seldomly used in decision-making (e.g., Coldwell et al., 2017; Cooper et al., 2017; Malin et al., 2020), but also very little evidence exists about how to make it matter more in policy and practice (Gorard et al., 2020). In Canada and abroad, governments and research funders are responding to this issue by increasing expectations that researchers engage in knowledge mobilization (KMb) efforts to advance the impacts of research (Cain et al., 2018; Kamenetzky & Hinrichs-Krapels, 2020; MacGregor & Cooper, 2019; McLean et al., 2018; Oancea, 2019; Sibbald et al., 2014; Smits & Dennis, 2014; Woolcott et al., 2020). A recent study by McLean et al. (2018), for example, found that among 26 health research funding agencies in Australia, Europe, and North America, KMb was a high priority area for “making research useful and actionable” (p. 12). Moreover, these same funders’ KMb efforts were more systematic than evidenced by the authors 10 years prior (Tetroe et al., 2008). It thus appears the case that building capacity in KMb and research impact have become core priorities for universities and the social systems in which they are embedded (Budtz Pedersen et al., 2020; McKean & Howard, 2017; Reed & Fazey, 2021).

KMb is a broad field of inquiry that deals with sharing knowledge among research production, mediation, and use contexts (Beckett et al., 2018; Davies et al., 2015; Levin, 2013; SSHRC, 2019). It encompasses many general approaches and specific activities that differ
according to factors such as the nature of the knowledge being mobilized, the connections and configurations among the individuals and organizations involved, and the actions and resources available (Davies et al., 2015). Generally, however, KMb is about intentional efforts to achieve impact from research knowledge as it interfaces with other types of knowledge generated in practice and policy contexts (Cooper, 2014; Phipps et al., 2016; Powell et al., 2017, 2018). Research impact, on the other hand, refers to “the influence scholarly and creative inquiry has upon wider society, intended as well as unintended, immediate as well as protracted” (FHSS, 2017, p. 4). Unlike research outputs (e.g., scholarly articles) and outcomes (e.g., research being read by policymakers), impacts are fundamentally about how research influences thinking and decision-making within academia and beyond (Reed et al., 2021; SSHRC, 2019). Hence, KMb efforts (the how) are undertaken with the intention of achieving impact (the what).

The now expansive literature on KMb and its related concepts (e.g., knowledge translation, knowledge exchange, knowledge brokering; Shaxon et al., 2012) belies the challenges researchers and universities face in understanding and engaging in effective patterns of practice (Belkhodja & Landry, 2007; Cain et al., 2018; Cooper et al., 2018; Nichols et al., 2013; Sá et al., 2011, 2012; Zuiker et al., 2019). Benneworth et al. (2018) highlighted two primary issues:

1. Similar to concepts such as community engagement, KMb is conceptually vague, and it is embedded to varying extents across the teaching, research, and “third mission” activities of universities.

2. Universities, as primary knowledge producers, are “extremely complex organisations,” and as such, “they have major inter-institutional differences based on their missions, study programmes, size and external environment. . . . [as well as] high intra-institutional
diversity due to being composed of different disciplinary communities with different norms and values” (pp. 137-138).

As a result of these issues, building capacity in KMb has, until recently, been largely an independent and ambiguous exercise for universities (Bayley & Phipps, 2019a; Powell et al., 2017), with few published evaluations to inform the design or operationalization of KMb-aligned structures and functions (Camden et al., 2015; Davies et al., 2015; Ward, 2017). In the face of increasing pressure to demonstrate societal impacts, the situation resembles what Watermeyer (2016) described as a “‘blind panic’ as universities struggle to reconcile their role(s) in the political, cultural, social and self-evidently knowledge economies, vacillating between detached and critical scrutineers or commentators and integrated accomplices of government, industry and business” (p. 201). Simply put, limited empirical evidence exists at all levels—individual, organizational, and social systems—about how to do KMb well.

It is now well-established that improving the current situation must begin with addressing the gulf between KMb theory and practice:

. . . the ironic situation that the field of knowledge mobilisation practice seems somewhat detached from its own knowledge base, with knowledge mobilisation activities often being developed and carried out without reference to the existing theory or to practical experience, and without the robust evaluations that could contribute to the knowledge base for the future.” (Powell et al., 2017, p. 217)

Many recent studies have taken to building up the evidence base for KMb, focusing on topics such as clarity in terminology and concepts (e.g., Neal et al., 2021; Nguyen et al., 2020; Rickinson et al., 2021), the verisimilitude and application of theory (e.g., Glegg et al., 2019; Haynes et al., 2020; Oliver et al., 2019), best practices in assessing research impact (e.g.,
Greenhalgh et al., 2016; Posner & Cvitanovic, 2019; Smit & Hessels, 2021; Wilsdon et al., 2015); and general principles and strategies (e.g., Hoekstra et al., 2020; Oliver & Cairney, 2019; Penuel et al., 2020). However, a critical lack of empirical research remains about the professional staff within universities who operationalize KMb. Despite their recognized importance as individuals with expertise in the “complex ways in which research is understood, resisted, taken up and adapted for local use” (Cooper et al., 2018, p. 94), little is known about their professional experiences and perspectives or their professional networks that aim to build capacity at scale. Attending to this gap in the literature is critical in light of the increasingly complex and transnational challenges facing society (e.g., climate change, the COVID-19 pandemic, social and economic inequities) for which university research, via KMb efforts, can play a central role in ameliorating (Kokshagina et al., 2021; Reed & Fazey, 2021).

In Canada, the leading authority on university-based KMb is Research Impact Canada (RIC; Cooper, 2014). This network of 23 universities (plus the Ontario Shores public teaching hospital) has devoted considerable effort to developing “the institutional capacity to support research impacts of faculty, students and partner organizations” (RIC, 2018a, para. 2). Members of RIC work in an intermediary role within their respective universities, occupying a “missing link in the evidence to action chain” (Ward et al., 2009, p. 267). Until now, only cursory examinations of RIC have been conducted (e.g., Cooper, 2013, 2014; Cooper et al., 2018; Edelstein, 2016; Sebba, 2013), meaning little is known about the lessons learned and the acquired KMb expertise of its individual members and their respective universities. Hence, this study aimed to address the abovementioned gap in the literature by examining the case of RIC, an organization poised to set a precedent for how universities can build their capacity in KMb to advance the societal impacts of research (detailed context for RIC below).
Purpose and Research Questions

The purpose of this dissertation was to critically examine how university-embedded professional staff are engaging in KMb capacity building in Canadian universities. Specific attention was given to these individuals’ professional networks in order to gain a broad perspective on key developments surrounding KMb and impact within the Canadian research enterprise. Data for this study were drawn primarily from a developmental evaluation (DE; Patton, 2011, 2016a) of RIC’s approach to building institutional KMb capacity, which employed a variety of qualitative and quantitative methods. Consistent with the principles of DE (described below), this research aimed not only to contribute to the KMb and research impact literatures, but also inform the future directions of the RIC network. The following overarching research question and sub-questions guided this study:

1. What are the network learning experiences of institutionally embedded professionals who facilitate KMb within Canadian universities?
   a. To what extent does a networked approach to building institutional KMb capacity result in learning that is useful and that contributes to the use of KMb concepts in practice?
   b. What are the broader challenges and opportunities of a networked approach to building institutional KMb capacity?
   c. How can network learning to develop institutional KMb capacity be structured to improve the use of KMb concepts in practice?

1 Unless explicitly stated, all mentions of “institution” in this study refer to universities rather than other knowledge-producing organizations (e.g., think tanks, non-governmental organizations).
A second research question crystallized throughout the DE in response to a particularly salient problem of practice. That is, the institutionally embedded KMb professionals included in this study were found to be struggling with how to support researchers and their external partners in measuring the impacts of co-production. Respecting that a DE “is developed (emergent design) as the innovation develops” and seeks to promote “intended use by intended users” (Patton, 2016b, p. 256), the second research question was constructed as follows:

2. What quantitative measurement tools (instruments and measures) have been used to measure impact in fields of study related to co-production?

The first research question is addressed throughout Chapters 2-4 of this manuscript, and the second research question is addressed in Chapter 5. To situate the common background of these chapters, the remaining sections of this introductory chapter outline: (a) the international and Canadian contexts for KMb and research impact; (b) the overarching research design, focusing on the essential elements of the DE; and (c) the structure and content of this thesis going forward.

**The Contexts for Knowledge Mobilization and Research Impact**

Discussions about the role of universities in society are increasingly enmeshed with the concept of impact. While some scholars argue that impact is “not a new concept but a complex, ongoing accumulation of shifting and reforming (re)conceptualisations and acclimatisation” (Pearce & Evans, 2018, p. 359), there is little question that the contemporary “impact agenda” has brought the concept to an exalted position in higher education policy environments. In one sense, the impact agenda concerns “the move to attempt to bureaucratically assess the social, cultural and economic impact of research” (Kidd & Chubb, 2021, p. 149). In a wider sense, it concerns a preoccupation with impact in national research systems, those focused on assessing
impact (i.e., assessment-driven systems), strategizing for impact (i.e., mission-driven systems), or some degree of both.

Governments, research funding agencies, and myriad research advocacy groups are reinvigorating Francis Bacon’s stance that research should inform on “things of use and practice for [public] life and knowledge” (Bacon, 1627, as cited by Hanney & González-Block, 2014, p. 2). However, not all have welcomed the concomitant changes to national research systems. Many scholars consider the impact agenda an imposition on the academic enterprise, decrying its restraining effect on academic freedom, promotion of an audit culture, and advancement of managerial control (e.g., Chubb & Watermeyer, 2017; MacDonald, 2017; Martin, 2011; Oancea, 2019). Regardless, impact is now a part of the global conversation about research and how it is used to effect change beyond the academy (Bayley & Phipps, 2019a). The sections that follow provide a high-level summary about how the impact agenda has taken shape internationally and in Canada. More specific context is provided as relevant throughout the chapters that follow.

**International Context for Impact**

Internationally, several major developments characterize the impact agenda. The most prominent development is the rise of assessment-driven research funding systems (Milat et al., 2015), with the UK’s Research Excellence Framework (REF) the best-known example. Recently completing its second iteration—the first being REF 2014, which itself built upon the UK’s Research Assessment Exercises—REF 2021 will allocate approximately £2 billion in annual research funding based on a ranked scoring of universities. One quarter of the score is tied to each university’s ability to demonstrate the wider impacts of its research (Stern, 2016). For some time, such research assessment models have been catching on; Hicks (2012), for example, identified 14 national performance-based research funding systems for universities: Australia,
Denmark, Finland, Norway, Belgium, Poland, Slovak Republic, Sweden, UK, Italy, Portugal, Spain, New Zealand, and Hong Kong.

However, it is not only research impact that is increasingly assessed. A KMb-focused assessment system that recently held its first exercise is the UK’s Knowledge Exchange Framework (KEF; see Research England, 2020). The KEF employs a metrics-led approach that draws upon knowledge exchange activity data already collected by UK universities (e.g., income for contracted research from the public and third sector). Presently, the results of the KEF are suggested to “allow universities to better understand and improve their own performance in knowledge exchange” (Research England, 2021, para. 2). However, even before the first results became available in March 2021, Research England’s (2020) implementation document made it clear that “it is likely that full participation in the KEF . . . will become a condition of Research England funding” (p. 4). With the advent of the REF and the KEF, alongside the Teaching Excellence Framework, which assesses teaching quality in higher education institutions (see ), UK universities are now assessed in all three of their core missions: teaching, research, and service (Williams & Grant, 2018).

Despite the rapid expansion of such assessment systems, their unintended consequences remain largely unknown and their cost-benefit balance uncertain (cf. Hodder & Hodder, 2010; Martin, 2011; Terämä et al., 2016). For instance, while it is known REF 2014 cost the UK higher education community approximately £246 million to operationalize (about 1% of the UK’s total research budget; Farla & Simmonds, 2015), other costs are still emerging, such as the narrowing of academic priorities (MacDonald, 2017), the potential for universities to “disconnect rather than solidify connections between different areas of the organisation to deliver on discrete agendas” (Bayley & Phipps, 2019b), and the dispossession of academic identity (i.e., where
competitive accountability drives research rather than intrinsic desires to make public contributions; Watermeyer & Tomlinson, 2021).

In tandem with the rise of assessment-driven systems, the methods used to assess impact are a topic of intensive discussion and activity. One position maintains that impact metrics are “another tightening of the neo-liberal, managerial audit culture that infests universities” (MacDonald, 2017, p. 706), emphasizing how a focus on narrowly-defined quantitative data sources can distort how impact is understood (Bonnell, 2016; Bornmann, 2017; Wilsdon et al., 2015). For example, a major review of the history of impact metrics in research management and assessment in the UK and internationally (Wilsdon et al., 2015) illustrated that despite the increasing use of these tools, few could be considered responsible metrics (i.e., exemplifying the qualities of robustness, humility, transparency, diversity, and reflexivity). A contrary position holds that the judicious application of best practices for impact measurement (e.g., Adam et al., 2018) can stimulate “increased reflexive practice among academic researchers and [recognition of] the merit and value of academic enterprise beyond the calculus of publications” (Watermeyer, 2014, p. 374). Further complicating the divergent views on impact measurement is the eruption of impact-like measures (e.g., journal impact factors, h-index) that have little empirical evidence for their robustness but are nonetheless being used to steer funding allocation in market-like incentive systems (Hicks, 2012; Williams & Grant, 2018). Regardless of the position taken on impact measurement, one issue is unambiguous and continually highlighted: the rise of impact measurement and assessment-driven systems have imposed sizeable and varied costs on researchers and other research stakeholders (e.g., Williams & Grant, 2018), compelling a need to consider other approaches to supporting and promoting impact. One such approach
involves a re-direction in focus from assessing impact to the KMb approaches and activities that may lead to impact (Bayley & Phipps, 2019a, 2019b).

One of the most comprehensive analyses of current KMb theory and practice is Davies et al.’s (2015) cross-sector mapping that included a synthesis of 71 published reviews on KMb, website review of the KMb activities of 186 research agencies, interviews with key informants from 51 of those agencies, a web survey distributed to individuals in the 186 agencies, and two stakeholder workshops to share emerging insights. Altogether, their results led to the development of eight archetypes for KMb: (a) producing knowledge, (b & c) brokering and intermediation (own research or wider research), (d) advocating evidence, (e & f) researching practice (research into practice or research in practice), (g) fostering networks (building on existing networks and developing new ones), and (h) advancing KMb as a field of study. Each archetype helps in characterizing the diverse patterns of practice encompassed by idealized types of KMb. However, despite their ability to conceptually map and differentiate their KMb archetypes, Davies et al. observed acute limitations in current understanding and practice for KMb. Specifically, in combination with more recent and diverse literature, several overarching challenges endure for the field of KMb:

- the need for more empirical research examining what approaches work across systems, sectors, and disciplines (Dwan et al., 2015; Levin, 2013; Shaxson et al., 2012);
- the gulf between KMb theory and practice (Davies et al., 2015; Nutley et al., 2019; Powell et al., 2017, 2018), with professional collaborations between KMb researchers and practitioners still relatively scarce;
- the need to “learn from a wider range of emergent literatures that show potential to enrich our understanding” (Davies et al., 2015, p. 132; see also Boaz et al., 2019);
• the lack of operational models, tools, and case examples of applying systems theory to KMb (Best & Holmes, 2010) in addition to complexity perspectives (e.g., Glegg et al., 2019; Kitson et al., 2018; Oliver & Faul, 2018); and

• the need to explore the roles and practices of knowledge intermediaries—a position that includes knowledge brokers, boundary spanners, embedded researchers, research mediators, among many others (Kivimaa et al., 2019)—engaged in KMb efforts (Cooper, 2014; Lightowler & Knight, 2013; Powell et al., 2017), particularly those working within research institutions (Bogenschneider, 2018; Cvitanovic et al., 2018)

The international momentum behind the impact agenda shows no sign of slowing down. There is an imperative to make inroads on the above challenge areas of KMb in order to enhance current thinking about supporting impact. This research aims to contribute to these inroads by focusing on the Canadian context.

**Canadian Context for Impact**

In Canada, there is national pressure from the federal Tri-Council of research funding agencies to advance the impacts of research, including SSHRC’s (2019) focus on KMb and knowledge exchange, the Canadian Institutes of Health Research’s (CIHR; 2020) focus on knowledge translation, and the Natural Sciences and Engineering Research Council of Canada’s (2013) focus on innovation and commercialization. Provincial research funding agencies (e.g., the Michael Smith Foundation for Health Research) and not-for-profit charitable organizations (e.g., FHSS) are also engaging in substantive efforts “to close the gap between research and implementation” (Michael Smith Foundation for Health Research, 2018, para. 1). As the profile of KMb has been elevated, capacity-building opportunities have also emerged across the country (e.g., the knowledge translation training programs offered by the Hospital for Sick Children, the
Certificate in Knowledge Mobilization offered by the University of Guelph, and the MobilizeU course offered by York University. Similarly, professional networking opportunities (e.g., the Canadian Knowledge Mobilization Forum and the Canadian Knowledge Transfer and Exchange Community of Practice) are beginning to attract wider audiences. An early review and synthesis of KMb literature from the health sector (Mitton et al., 2007) also showed Canadian researchers to be leaders in the publication of high-quality empirical articles. At the same time, these efforts are contrasted with recent critiques that in Canada “there remains too much simplistic thinking about how evidence moves into [policy and] practice” (Holmes & Strauss, 2019, The Nature of Evidence section, para. 7).

Despite the increasing governance for how research comes to have impacts and the many capacity-building opportunities now available, KMb remains a peripheral concern for many Canadian researchers (Cooper, 2017; Cooper et al., 2018; Fischman et al., 2018; Zuiker et al., 2019) and without robust institutional backing (Cooper, 2015; Cooper et al., 2009; Qi & Levin, 2013; Sá et al., 2011, 2012). Moreover, approaches that tap into the potential for research intermediaries such as RIC have received only passing attention (e.g., Cooper, 2013, 2014; Cooper et al., 2018; Edelstein, 2016; Sebba, 2013). Consequently, this study focuses on the lessons learned and the acquired KMb and impact expertise of RIC.

**Research Impact Canada**

RIC was founded in 2006 by means of a SSHRC/CIHR Intellectual Property Mobilization grant, with the aim of building institutional KMb capacity analogous to university-based technology transfer offices (Phipps, 2011). In the time since, RIC has grown from a two-university collaboration into a network of 23 universities. Spanning all provinces apart from Prince Edward Island, RIC contains eight of the U15 member universities (i.e., a collective of
Canada’s most research-intensive universities) as well as the University of Brighton (UK) as an international partner. Despite its modest operating budget in comparison with larger research intermediary organizations, RIC’s KMb efforts rank among the most impressive in Canada (Cooper, 2014). RIC’s commitment to progressing impact through KMb is exemplified in its mandate, mission, and vision:

- **Mandate**: “RIC builds institutional capacity to help Canada’s researchers and students span boundaries, collaborate, and connect their work to new services, products, processes, systems, public policies, and innovations with social, economic, cultural, environmental, commercial, and scientific value”;

- **Mission**: “We build Canada’s capacity to be a leader in creating value from knowledge by developing and sharing best practices, services and tools, and by demonstrating to relevant stakeholders and the public the positive impacts of mobilizing knowledge”; and

- **Vision**: “A globally leading network which supports researchers, students and their partners to demonstrate the contribution to and impact of research excellence” (RIC, 2018b, pp. 2-3).

The work of RIC is currently one of the few examples of a sustained approach to building institutional KMb capacity (Phipps et al., 2015) rather than short-term or project-based approaches. Moreover, unlike networks that focus on a specific discipline or subject (e.g., PREVNet, a network that seeks to create impacts from research on bullying), RIC supports researchers and research stakeholders who are working to maximize the impact of research across disciplines. The Advancing Research in Society (ARIS) network in the United States is the only comparable example of RIC’s efforts, yet ARIS focuses on developing the capacity of researchers rather than institutions.
The efforts of RIC are carried out by “a community of practice for research mobilization and includes knowledge brokers, researchers, and other practitioners looking to exchange information on best practices, past successes, and future directions” (McKean & Robbins, 2016, p. 6). This community of practice has undergone steady, yet increasingly rapid, evolution since its foundation:

- **2006**: York University and the University of Victoria (note, from 2006-2017, the network was called “ResearchImpact”);
- **2010–2011**: Memorial University of Newfoundland and Labrador, Université du Québec à Montréal, University of Guelph, and University of Saskatchewan;
- **2012**: Université du Montréal, Carleton University, Wilfrid Laurier University, and Kwantlen Polytechnic University;
- **2014**: McMaster University;
- **2015**: the University of New Brunswick;
- **2017**: the University of British Columbia, Western University, and the University of Brighton (UK, first international affiliate member);
- **2018**: the University of Alberta, the University of Winnipeg, Dalhousie University, and the University of Ottawa;
- **2020**: the University of Regina, the University of Calgary, Bishop’s University, and Simon Fraser University;
- **2021**: Concordia University, Athabasca University, Ontario Shores Centre for Mental Health Sciences (first non-academic member).

- Note: Wilfrid Laurier and Western University have since stepped away from RIC
To join RIC, prospective partner institutions must apply and fulfil criteria developed by existing members that assess commitment to KMb:

Indicators of commitment include the availability of dedicated staff for research mobilization, the availability of research grants, and steady funding for knowledge brokering. At a minimum, each ResearchImpact Network member must have the equivalent of one full-time staff dedicated to knowledge mobilization, pay an annual $5,000 consortium membership fee (which goes to website upkeep, meeting costs, etc), and dedicate $5,000 in time and travel costs for staff to attend the Network’s annual meeting. (McKean & Robbins, 2016, p. 7)

An additional criterion is an enthusiasm for KMb evidenced in institutional principles and operations. Together, these requirements establish the expectation that universities demonstrate a commitment to KMb in terms of a variety of organizational variables (e.g., absorption, learning, culture, and linkage mechanisms; Belkhodja et al., 2007).

At the time RIC was chosen as the focal group for the present study, a number of internal factors influenced how its efforts could be investigated:

1. In 2016, for the first time since its foundation, RIC began preparing for a new lead institution. York University had served as the lead institution since 2006, but in order to support continued innovation in building institutional KMb capacity, RIC’s Steering Committee determined it was time to invite new leadership. Presently, York University will remain the lead institution until 2024, at which time this role will transition to the institution being prepped for network leadership between 2021-2024. This transition will be accompanied by a new network leadership model. Specifically, going forward, member institutions will be able to hold the position of lead institution for a maximum of
two consecutive three-year terms, and during their term, they will provide mentorship to the incoming lead institution. In this way, each incoming lead institution has received three years of mentorship before taking on the overall leadership role and beginning the mentorship process with the next lead institution.

2. When this study began in mid-2018, RIC included only 14 of its current 23 universities. However, the network was growing in at least three distinct ways. First, RIC was in the early stages of onboarding several new member institutions and implementing various capacity-building initiatives to support its increasingly diverse membership (see Chapter 2). Second, the network was becoming increasingly international in its interactions, exemplified by its recent addition of a UK-based member institution and its exploration of partnership opportunities with groups such as the US-based Advancing Research Impact in Society Center. Third, RIC’s Governance Committee recently resolved to open membership to non-academic institutions possessing a KMb mandate (see RIC, 2021). While RIC previously restricted membership to universities, this trial period with non-academic institutions—the first being Ontario Shores—was initiated with the perspective that network diversity can increase the value proposition for members.

3. In early 2019, RIC was invited by the Conference Board of Canada (a not-for-profit research organization) to partner on KMb initiatives with the Future Skills Centre, a centre funded by but independent from the Government of Canada that researches and builds partnerships around future skills issues. With the funding from this partnership, RIC employed a network management team comprising a KMb coordinator, two KMb specialists, and a network manager. This team has since led many operational elements of
RIC, including the annual general meeting, the development of RIC’s website, and the coordination of network-focused KMb activities.

In view of these contextual circumstances, the design of this study intended not only to advance the scholarly literature about KMb capacity building in universities, but also lessen the divide between research and practice.

**Overarching Methodology**

This study was designed as a mixed methods DE. Although there is a recent trend of evaluators working at the intersection of these approaches to analyzing social systems (e.g., Guilcher et al., 2020; Laycock et al., 2019; Wu et al., 2018), there exists little guidance on designing empirical studies of this nature. As a result, a related output of this dissertation was an article that interrogated the use of mixed methods approaches within DE contexts, appearing in *The Canadian Journal of Program Evaluation* (see MacGregor & Cooper, in press). While that article is not included in this dissertation, the relevant details that pertain to this study and which provide the methodological basis for the chapters that follow are summarized below.

**Why DE?**

In mid-2018, I contacted the Network Director of RIC to communicate my interest in studying the network’s efforts to build institutional KMb capacity. At that time, RIC was grappling with the various internal factors outlined above: considering a new lead institution, growing rapidly, and partnering with other organizations in Canada. Additionally, there were a number of external factors introducing new challenges and opportunities for RIC, including the shifting research policy environment in Canada (e.g., Ontario adopting a new performance-based funding model for higher education institutions) and the progressively untenable disconnect between KMb research and practice. Collectively, these factors meant that both RIC and its
contexts constituted a *dynamical system* (Patton, 2011), for which change was largely unpredictable, nonlinear, and complex. It was determined that traditional cross-sectional or longitudinal research designs (qualitative or quantitative) that sustained the roles of “researcher and the researched” (Stake, 2003) were unlikely to (a) provide rich insights into how the complex system of institutionally embedded KMb professionals, their universities, and the broader network context was evolving; or (b) address the noted research-practice gap. Moreover, in collaboration with the Network Director, emphasis was placed on respecting Cousins and Shulha’s (2006) observation that,

>P]ossibly the most significant development of the past decade in both research and evaluation communities has been a more general acceptance that *how* we work with clients and practitioners can be as meaningful and consequential as what we learn from our methods.” (p. 277)

From this reasoning, we determined that a utilization-focused evaluation process that simultaneously sought theoretical and practical contributions was needed.

It was decided early on that neither formative nor summative evaluation accorded with RIC’s goals. The dynamical nature of its network and context meant that movement towards stabilized and standardized initiatives might run counter its mission. Additionally, the goal of the evaluation could not be “improvement” in the sense that the RIC would soon reach a semi-permanent “better” state. There was instead a need to support RIC in “constantly experimenting, adapting and developing what they do in response to program participants’ feedback, changing conditions, new insights, and emerging challenges all around them” (Patton, 2011, p. 41). To meet this need of *ongoing development* (Patton, 2011), the evaluation approach of DE was employed.
The utility of DE for facilitating “collaborative, complex, and evolving change processes” (Preskill & Beer, 2012, p. 7) has become increasingly recognized in the KMb literature (e.g., Cooper et al., 2020; Edwards & Meagher, 2020; Haynes et al., 2020; Langeveld et al., 2016; Norström et al., 2020; Peurach et al., 2016; Wutzke et al., 2018). In contrast to formative and summative evaluations, DE offers a more dynamic and collaborative approach to evaluation in which systems thinking and complexity concepts are applied to inform “adaptive development” (Patton, 2016a, p. 4)—development in response to changing contexts, stakeholders, understandings, or alternatives to the current program.

The Characteristics of DE

With its distinct purpose and niche, DE respects specific principles, each of which must be explicitly addressed in order for an evaluation to have integrity (Patton, 2016b, 2016c). Table 1.1 outlines the eight essential principles of DE and how they were respected in this study.

<table>
<thead>
<tr>
<th>Essential Principle</th>
<th>Methodological Implications</th>
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<tbody>
<tr>
<td>Developmental purpose</td>
<td>The DE has supported ongoing adaptive development based on changing conditions, new understandings, and a growing network. Evaluation methods developed as RIC developed, with emergent findings used to improve alignment between the methods and the network’s needs. For example, as the need for research impact assessment tools in the area of co-production became evident, the second research question was created.</td>
</tr>
<tr>
<td>Evaluation rigor</td>
<td>At all points in the DE, data collection and analysis decisions were empirically driven and focused on the interests, contextual circumstances, and outcomes relevant to RIC.</td>
</tr>
<tr>
<td>Utilization focus</td>
<td>A consistent emphasis was “intended use by intended users” (Patton, 2016c, p. 256), entailing a focus on facilitating decision making about RIC’s adaptations to dynamic internal and external contexts.</td>
</tr>
<tr>
<td>Innovation niche</td>
<td>RIC focuses on developing of impact-healthy institutions that create, value, and support “the space needed to drive research effects beyond academia” (Bayley &amp; Phipps, 2019c). Given this broad remit, the DE has drawn from a variety of literatures that intersect with KMb (e.g., professional learning networks, impact assessment, knowledge brokering).</td>
</tr>
</tbody>
</table>
With the purpose of ongoing development resolved, the next step was to determine the methodological approach that would support RIC as an innovative mechanism for building institutional KMb capacity. This work began with examining the co-produced RIC evaluation framework that had been developed in early 2018 but had not yet seen implementation (Appendix A). The first element of the framework was a logic model linking RIC’s vision to its audiences, enabling conditions, common activities, and short- and long-term outcomes. The second element was a measurement overview linking the dimensions of the logic model to data collection priorities. These priorities were kept general (e.g., “qualitative data on how RIC works together & meaning of network for members”), meaning that methods to collect such data were undecided at the time. To build familiarity with the evaluation framework and the RIC network, I reviewed previously collected quantitative event data (e.g., participant self-report data from earlier webinars) and supported the collection and analysis of qualitative data at the network’s annual meeting in September 2018. This initial work focused on building relational trust by supporting existing evaluation efforts. What became clear in this initial work was RIC’s readiness to collect and co-construct meaning from multiple types of data.
Following the annual meeting in September 2018, I joined RIC’s Evaluation Committee, ensuring the evaluation was intertwined with the network’s innovative work (Patton, 2011). Over the ensuing four months, I reviewed findings from the data mentioned above, contrasting emerging insights with the contemporary scholarly and grey literature. Drawing initially from the similar evaluation efforts of the Michael Smith Foundation for Health Research² (Penny Cooper & Associates, 2017), two areas of focus for RIC were settled on for providing meaningful information about RIC’s activities: usefulness and use. **Usefulness** addressed the quality of RIC’s activities in terms of members’ perceptions of their appropriateness, applicability, and practicality. **Use** addressed how members employed the information gained from those activities in their professional practice. These concepts are represented in Research Question 1a.

The methods employed followed an explanatory sequential mixed methods design (Creswell & Plano Clark, 2018), wherein the qualitative strand helped explain initial findings from the quantitative strand (Figure 1.1). Initially, this meant two general phases. First, focusing on the usefulness construct, I led the Evaluation Committee in co-creating and deploying a survey to RIC’s Governance Committee (i.e., RIC members who oversee the network’s activities and strategic planning). Second, focusing on the use construct, we used the survey results to identify key areas for developmental feedback to explore in the qualitative strand. The survey results also helped in building a sampling frame of RIC members (intended users) likely to provide information supporting adaptation of the network’s activities (intended use). Despite any apparent rigidity of this mixed methods design (see Fetters et al., 2013), which would not accord with the systems thinking and complexity perspective principles of DE, we found success by (a)

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² A health research funding agency in Canada with a focus similar to RIC on improving the societal impacts of research ([https://www.msfhr.org/about](https://www.msfhr.org/about)).
explicitly planning for ongoing and fluid dialogue between the quantitative and qualitative strands, (b) permitting the strands to evolve independently and jointly to improve alignment with the evaluation context, and (c) keeping the intended use of findings foregrounded.
Procedural Diagram for the Mixed Methods Developmental Evaluation of Research Impact Canada
As an example of keeping the MM design emergent and flexible, the “post annual meeting survey” depicted in Figure 1.1 was not included in the original data collection plan. However, the confluence of several factors created an immediate need to know about RIC members’ perceived outcomes from the annual meeting in addition to areas for improvement. These factors included the creation of RIC’s Management Team in September 2019, an inbound change in network leadership, and the growth of the network by three universities. Although data collection for the qualitative strand was also set to begin at that time (December 2019), we realized that generating insights from the semi-structured interviews would require more time than available to support imminent long-term planning. Rather than resist a change to our original planning, this situation created an opportunity for flexible integration. Structured interview questions originally considered for the interview protocol were adapted for the survey, creating space for more open-ended conversation in the interviews. With the survey and interviews implemented in parallel, we were able to focus on merging the quantitative and qualitative findings for analysis and comparison, identifying insights that would go otherwise unknown (e.g., RIC members were craving information about how to teach KMb concepts to faculty and graduate students).

Points of interface in Figure 1.1 (i.e., timepoints when the quantitative and qualitative strands informed one another) are identified using arrows crossing the quantitative–qualitative divide. Throughout the DE, there were four noteworthy points of interface, collectively forming the “temporal flow of activities” (Plano Clark, 2019, p. 109). However, representation of these points belies the dynamic, non-linear nature of how integration informed action. Giving primacy to ongoing feedback, these points are best seen as lodestars around which constellations of stakeholder conversations and integration actions were distributed. Each action or conversation
contributed in some small way to single-loop learning (i.e., informing action to address an identified issue), but it was the constellation of these that helped in mitigating uncertainty and creating the potential for double-loop learning (i.e., “solutions to change the system itself”; Patton, 2011, p. 11). This viewpoint supported the balanced perspective that learning processes “in emergent programs are likely to be subconscious, leading to haphazard and incidental learning” (Shea & Taylor, 2017, p. 87). By not focusing on double-loop learning as the sole goal for the DE, informing action through integration was gradual and interactive, though still in the direction of systems change.

As the bottom of Figure 1.1 illustrates, a tiered approach was implemented to involve RIC’s various stakeholders in the DE. Based on conversations with the Network Director and the Evaluation Committee, tiered involvement ensured the DE respected each stakeholder group’s available time and the complementarity of their knowledge and skills for specific components of the evaluation. Every DE product was co-created, including the data collection tools and reporting products, yet it was decided early on that an everyone-at-once method for co-creation would be more burdensome than useful. The general pattern of stakeholder involvement was as follows:

- **Network Director**: unconnected only during the collection and management of identifiable data;
- **Evaluation Committee**: developing data collection tools and reporting products;
- **Governance Committee**: providing initial guidance and reviewing executive summaries of qualitative and quantitative findings;
- **Management Team**: supporting alignment with the broad spectrum of RIC’s activities; and
• **Broader Membership:** reviewing executive summaries and full findings reports.

Each stakeholder group had a role to play in the DE; yet, coordinating this complex involvement meant grappling with the tension of providing rapid feedback while representing the diversity of perspectives. In the chapters that follow—particularly Chapters 2 and 3—I detail how that tension was navigated in order to generate both practice-relevant insights for RIC as well as empirical, theoretical, and methodological contributions to the study of KMb.

**Multiple-Manuscript Format**

This dissertation follows a multiple-manuscript format organized into an introductory chapter, four chapters that address the research questions set out above (see Table 1.2 on page 29), and a final discussion chapter. This first chapter introduces the background of the study, the purpose and research questions, the international and Canadian contexts of this research, and the overarching methodology and case context for the DE.

The second chapter, “*How a networked approach to building capacity in knowledge mobilization supports research impact,*” addresses Research Question 1a. It presents the initial evaluative efforts (Phase I) of the DE, which focused on the perceptions of 16 leaders of RIC, representing 14 networked universities, about the usefulness and use of network learning to build institutional capacity in KMb. Through a mixed-methods survey design, two themes are explored: (a) the contextual variability in how institutions engage in KMb, and how practice-based subgroups can support the diverse KMb needs of different institutions; and (b) how capacity developed through network learning is distributed among individuals and groups within institutions, and how networked institutions need to be self-referential to the ways knowledge about KMb is sourced, validated, shared, interpreted, and employed.
The third chapter, “Network learning for knowledge mobilization: Universities and the pursuit of research impact,” addresses Research Questions 1b and 1c. It presents Phase II of the DE, which recruited 20 key informants from 15 of the (at the time) 17 RIC member institutions to explore their experiences and perspectives on network learning and how it could be structured to improve the disconnect between KMb theory and practice. Three overarching themes surfaced in the analysis: (a) the diversity of approaches to KMb, and (b) the network’s ethos of impact, and (c) key tensions for network learning.

The fourth chapter, “The active engagement of higher education institutions will foster the future of knowledge mobilization,” addresses Research Question 1 in broad scope. In keeping with the principles of DE, the purpose of this chapter was to co-create insights about the role that universities will play in the future of KMb, based on observed trends leading from past developments to the current landscape. The findings focus on several themes observed when looking across Phase I and Phase II of the DE, which were then supplemented with narrative representations from several of RIC’s experienced members. Two general sections are used to organize the findings: (a) recommendations from RIC members about how KMb professionals can flourish in their institutional environments, and (b) questions they believe the higher education sector needs to give particular consideration in the years ahead.

The fifth chapter, “An overview of quantitative instruments and measures for impact in co-production,” addresses the second research question. As noted above, the impetus for this chapter developed throughout the DE, with many participants in the previous chapters sharing that measuring the impacts of co-production presented an enduring problem of practice. Hence, the purpose of this chapter was to examine the quantitative measurement tools used in fields of study related to coproduction in order to inform the measurement of impact. An
overview methodology was used to synthesize the findings from prior instrument reviews, focusing on the contexts in which measurement tools have been used, the main constructs and content themes of the tools, and the extent to which the tools display promising psychometric and pragmatic qualities. Eight identified reviews described 441 instruments and measures designed to capture various aspects of knowledge being mobilized among diverse research stakeholders.

Bearing in mind the aforementioned need to draw on a greater range of “emergent literatures” (Davies et al., 2015, p. 132) in the study of KMb, Chapters 2-5 integrate diverse scholarly sources to address the research questions (Figure 1.2). The final chapter then summarizes the findings of this study in relation to each research question, highlighting the empirical, theoretical, and methodological contributions. From this basis, the final chapter outlines recommendations for KMb professionals, their professional networks, and universities.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Primary Method(s)</th>
<th>Data Source</th>
<th>Data Collection</th>
<th>Sampling</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a &amp; 1c</td>
<td>Convergent design: quantitative and qualitative data were collected concurrently, analyzed separately, and then merged for comparison and integration</td>
<td>Leaders (N = 16) from 14 of RIC’s member institutions. Note: at this time, RIC comprised 17 member institutions</td>
<td>Appendix A: Evaluation Framework Appendix B: Survey for Phase I of the DE</td>
<td>“Internal RIC” actors (network contributors, Governance Committee, institutional executive leads) who possess extensive knowledge of and experience with RIC</td>
<td>Descriptive statistics and correlation analysis of the quantitative data. General inductive analysis of the qualitative data. Two data sets merged once represented in meaningful ways. Several feedback loops with different RIC stakeholders to inform Phase II of the DE.</td>
</tr>
<tr>
<td>1b &amp; 1c</td>
<td>Semi-structured interviews, lasting 60–90 minutes</td>
<td>Key informants (N = 20) from 15 of RIC’s member institutions. Note: at this time, RIC comprised 20 member institutions</td>
<td>Appendix C: Interview Protocol for Phase II of the DE</td>
<td>Same as above</td>
<td>Constant comparative method to inductively break down, examine, compare, conceptualize, and categorize the data, with emphasis on process coding and structural coding. Several feedback loops with different RIC stakeholders in the form of “ongoing sense-making activities”.</td>
</tr>
<tr>
<td>2</td>
<td>Overview (also called an umbrella review)</td>
<td>Eight literature reviews on the extant measurement tools for capturing the various aspects of knowledge being mobilized among diverse research stakeholders</td>
<td>Appendix D: Overview Charting Form See Chapter 5, Identifying Relevant Articles and Article Selection</td>
<td>(a) the contexts in which measurement tools have been used, (b) the main constructs and content themes of the tools, and (c) the psychometric and pragmatic qualities of the tools</td>
<td>(a) the contexts in which measurement tools have been used, (b) the main constructs and content themes of the tools, and (c) the psychometric and pragmatic qualities of the tools</td>
</tr>
</tbody>
</table>
Figure 1.2
Scholarly Literatures Integrated Throughout the Four Main Chapters

Note. Dotted lines at the top of the figure indicate where general concepts from that literature base were considered but not directly referenced, whereas solid lines indicate where sources from that literature base were central to the concepts and arguments raised.
Chapter 2

How a Networked Approach to Building Capacity in Knowledge Mobilization Supports Research Impact

Preamble

In late 2018, after completing my first comprehensive examination and receiving ethical approval of this study, I joined Research Impact Canada’s Evaluation Committee. Over the ensuring fourth months, we co-created a data collection and analysis plan for the network’s developmental evaluation (DE). This chapter presents the findings from Phase I of the developmental evaluation, which provided RIC with a general picture about the extent to which network learning activities were creating value for the membership (practice contribution) as well as some of the first empirical evidence about building institutional KMb capacity (empirical contribution). I led the design of this research as well as all data collection and analysis procedures, and co-wrote the chapter with Dr. David Phipps (Network Director, Research Impact Canada; Assistant Vice President, Research Strategy and Impact, York University). This work first appeared in the International Journal of Education Policy and Leadership in 2020. It should be noted that during the review process, a reviewer urged that we use the more familiar language of “case study evaluation.” Although we abided by this request, we maintained the language of “developmental approach” to signify that this work, in fact, derived from a developmental evaluation.

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Introduction

Research impact is emerging as a prominent feature of national research systems. In general terms, research impact (hereafter, impact) refers to the outcomes of research upon broader society, those “intended as well as unintended, immediate as well as protracted” (Federation for the Humanities and Social Sciences, 2017, p. 4). Some countries such as the UK (Research Excellence Framework [REF]), Australia (Engagement and Impact Assessment [Australia Research Council, 2015]), and the Netherlands (Standard Evaluation Protocol [Koninklijke Nederlandse, n.d.]) have adopted system-wide impact assessment schemes. In others, researchers are required to describe the impact of their research in research grant applications and reports. In Canada, these developments are exemplified by a knowledge translation strategy for health research grant applications or a knowledge mobilization (KMb) strategy for social sciences and humanities grant applications. These two systems have been referred to as assessment driven (UK, Australia) and mission driven (Canada), with the latter being advanced by researcher, institution, or funder goals (Bayley & Phipps, 2019a). At present, there is a proliferation of assessment-driven systems and their associated impact metrics, despite their sizeable and varied costs for researchers and institutions (Williams & Grant, 2018). Few studies have looked elsewhere to approaches garnering success in mission-driven systems.

The present study spotlights the case of Research Impact Canada (RIC), a network of 17 universities (16 in Canada plus the University of Brighton in the UK) that was founded in 2006 to support researchers creating impact in a mission-driven system (RIC, 2017, 2018a). RIC is a community of practice designed to share diverse methods for supporting connections between science (in all disciplines) and society to maximize the social, cultural, health, economic, and environmental impacts of research on local and global communities.
The aim of this article is to present findings from an ongoing case study evaluation of RIC’s efforts that illustrate the usefulness and use (Penny Cooper & Associates, 2017) of its network activities to build institutional capacity for KMb. It addresses the following question: To what extent does a networked approach to building institutional capacity for KMb result in learning that is useful and that contributes to the use of KMb concepts in practice? While there is much literature on the public policies that drive the impact agenda and the practice of maximizing impacts in research projects, there is comparatively little empirical evidence on the role of the institution (e.g., policies, procedures, staff, funding). Institutions are the members of RIC and the mission of RIC is to build institutional KMb capacity; hence, the evaluative work presented in this study provides evidence about which efforts to build KMb capacity are useful and contribute to the use of KMb practices for RIC members.

**Theoretical Perspectives**

The article begins by briefly reviewing recent developments in the global impact landscape and describing how RIC is situated in that landscape.

**Planning for Impact and the Development of Impact Networks**

Assessing impact, as well as describing and explaining its relationship with research use, has mushroomed as a field of study in the past 20 years (Boaz & Nutley, 2019). The most prominent development internationally has been the rise of assessment-driven research funding systems (Milat et al., 2015); the UK’s REF is the most developed and widely known example. Now approaching its second iteration—the first being REF 2014, which itself built upon the UK’s Research Assessment Exercises—REF 2021 will allocate about £2 billion in annual research funding based on a ranked scoring of universities. One-quarter of the score will be tied to each university’s ability to demonstrate the wider impacts of its research (Stern, 2016). This
model has been catching on; Hicks (2012), for example, identified 14 national performance-based research funding systems for universities: Australia, Denmark, Finland, Norway, Belgium, Poland, Slovak Republic, Sweden, UK, Italy, Portugal, Spain, New Zealand, and Hong Kong. The expansion of these systems has resulted in unintended effects that are still emerging and a cost-benefit balance that remains uncertain (Hodder & Hodder, 2010; Martin, 2011; Terämä et al., 2016). For instance, while it is known that REF 2014 cost the UK higher education community approximately £246 million to operationalize (about one percent of the UK’s total research budget; see Farla & Simmonds, 2015), other costs, such as the narrowing of academic priorities and an increase in research income inequality among institutions, are still emerging (MacDonald, 2017; Pinar & Unlu, 2020).

In contrast with assessment-driven systems and their concomitant focus on measuring impact, mission-driven systems direct focus to the theoretical frameworks that underpin and inform impact pathways. Mission-driven systems do not incur the costs of assessment and maintain greater academic freedom by putting the choice to pursue broader impacts on the researcher, not making it a requirement. Several recent reviews of impact frameworks (see Greenhalgh et al., 2016; Rivera et al., 2017) demonstrate that many find their origins in the Payback Model. Dating back to 1996, the Payback Model has two key features: (1) a seven-stage logic model from topic or issue identification to final research outcomes, and (2) five bins for identifying impact (e.g., knowledge, benefits to policy). More recently, the Co-Produced Pathway to Impact (CPPI; Phipps et al., 2016) is a framework first published in 2016 (and thus absent from some recent reviews). Unlike frameworks that conceptually model impact pathways and are not intended for use in practice (e.g., Field et al., 2014), the CPPI has been adopted, adapted, and implemented by several Canadian research networks, including PREVNet, which
co-produced the CPPI for its projects that are achieving impact on bullying prevention. The CPPI sets up a relationship between researchers and other research stakeholders (in its phrasing, co-production partners) throughout impact pathways that is predicated on stakeholder engagement before, during, and after the research has been completed. These relationships between researchers and stakeholders are particularly important within mission-driven systems that focus more on planning for impact (ex ante, starting at the beginning and proceeding throughout the research process) than on impact assessment (usually ex post, at the end of the research process).

PREVNet is an example of a research network designed to create impacts from research on bullying. Networks designed to create socioeconomic impacts in a specific discipline are ubiquitous. In fact, Canada has a funding program called the Networks of Centres of Excellence (2017) that “offers a suite of programs that mobilize Canada’s best research, development and entrepreneurial expertise and focus it on specific issues and strategic areas” (para. 1). In comparison, RIC is a fundamentally different network in that it does not focus on a specific discipline or subject. RIC is a collective of institutions examining their policies, practices, staffing, and services that support researchers and research stakeholders that are working to maximize the impact of research across disciplines. The Advancing Research Impact in Society (ARIS) network is a similar network based in the U.S. but with a focus on the researcher rather than the institution. Moreover, while there are many networks focused on commercialization as an impact practice (AUTM based in the United States, PraxisAuril in the UK, Knowledge Commercialization Australia), RIC and ARIS are the only two networks in the world focused on non-commercial transactions that maximize the impacts of research across all disciplines.
KMb and the Case of Research Impact Canada

KMb is concerned with the processes and activities that enable research to inform decisions about public policy, professional practice, and social services. Identified by some as an umbrella term for the sharing of knowledge (e.g., Beckett et al., 2018), KMb has relevance for research from the social sciences and humanities, health, and natural sciences and engineering. At the institutional level, KMb involves a suite of services that work together to support the multidirectional connection of researchers with decision-makers (Phipps, 2011). The foundation of any institutional KMb capacity is thus the connections among researchers and research stakeholders who can take up the results of research and turn them into public policies, professional practices, and social services (Phipps et al., 2016; Beckett et al., 2018).

Founded in 2006 by York University and the University of Victoria, RIC is Canada’s KMb network. The 17 institutions currently constituting RIC have joined at various points since its foundation.

- 2010–2011: Memorial University of Newfoundland and Labrador, Université du Québec à Montréal, University of Guelph, and University of Saskatchewan
- 2012: Université du Montréal, Carleton University, Wilfrid Laurier University*, and Kwantlen Polytechnic University
- 2014–2015: McMaster University and University of New Brunswick
- 2017: University of British Columbia, Western University*, and the University of Brighton (U.K., first international affiliate member)
- 2018: University of Alberta, University of Winnipeg, Dalhousie University, and University of Ottawa
*Note: Wilfrid Laurier and Western University have subsequently stepped away from RIC.*

These institutions are a mix of large universities with medical schools, comprehensive universities, and primarily undergraduate universities. Some are located in large urban centres, while others are in small cities and in suburban settings.

In addition to their operational and geographic diversity, member institutions are responsive to local and regional opportunities and constraints:

Network members all have a different knowledge mobilization approach, portfolio, and capacity. For example, some members have a dedicated unit for knowledge mobilization across campus with multiple staff, while others focus their work on a faculty or college of larger institution, or function as a semi-autonomous centre embedded in the local community. Similarly, RIC member institutions all have individual plans to track their knowledge mobilization work. (Bergen, 2019, para. 8)

Thus, while RIC’s member institutions have also been termed KMb units or nodes (McKean & Robbins, 2016), what that means in terms of the different actors and their interactions varies across institutions. For example, institutional KMb services have included research partnerships, support for grant applications, research communications, public and community engagement, engaged scholarship, service learning, student internships, and government relations. It is this heterogeneity among member institutions and their connections with one another that contributes to RIC as a compelling mechanism for building institutional capacity for KMb. Together, they build value for one another by sharing knowledge and resources, reducing uncertainty in the Canadian mission-driven impact environment, enhancing the legitimacy of their practice,
attaining collective goals, and expanding interconnections within their local, organizational, and external contexts (Muijs et al., 2010; RIC, 2018a).

As a network, RIC builds institutional capacity to help Canada’s researchers and students span boundaries, collaborate, and connect their work to new services, products, processes, systems, public policies, and innovations with social, economic, cultural, environmental, commercial, and scientific value. The vision of RIC is to become a globally leading network that enables researchers and their partners to demonstrate a contribution to research excellence and outline its impact. The mission of RIC is to build Canada’s capacity to be a leader in creating value from knowledge by developing and sharing best practices, services, and tools, and by demonstrating the positive impacts of mobilizing knowledge to relevant stakeholders and the public.

As a community of practice, RIC builds the capacity of its members to support diverse KMb practices. RIC’s Professional Development Committee oversees four capacity-building initiatives.

*KMb Tools:* RIC is capturing the diverse KMb practices of its member institutions, writing them up as tools and posting them on the RIC website. Each tool is developed with the following elements: (a) purpose; (b) key items required; (c) intended audiences; (d) resources required; (e) planning/workplan; (f) evaluation; (g) references; and (h) contact information. One example is the KMb tool for an engaged scholarship event titled KM in the AM (RIC, 2018b) developed by the Knowledge Mobilization Unit at York University in Toronto, Canada. In addition to the sharing of experiences that follows from different institutions utilizing these tools, efforts are underway to record members’ experiences with RIC’s KMb Tools to build collective understanding of why certain strategies work in particular contexts.
**Webinars:** All of RIC’s KMb Tools are publicly accessible, but live webinars are presented for RIC members only. The recordings are later posted and made publicly available. These webinars are on diverse topics related to KMb and impact, and they provide a link to additional resources and tools. One example is the webinar “Supporting Research Impact in Grant Applications” (RIC, 2019) where KMb York presented the theory underpinning the tools developed at York University to support impact strategies in grant applications.

**KMbuddy:** The Knowledge Mobilization Buddy (KMbuddy) is a new initiative designed to fund a capacity-building program between two or more RIC members. Often this will involve a trip to establish a mentor–mentee relationship built around a specific need of the mentee and specific capacity or competence of the mentor. This program was rolled out in spring 2019, with KMbuddy activities occurring over the summer and fall of 2019.

**Dr. RIC:** Dr. RIC is a monthly membership engagement video call where members set the agenda each month. The agenda is distributed to the RIC network, and members interested in the agenda can dial in for one hour of membership exchange. It is the exchanges between members that build capacity. Often members struggle with similar issues but struggle in isolation on their own campuses. RIC and Dr. RIC provide a forum for “finding your tribe.” For example, one RIC member asked to discuss internal grants and awards for KMb. The response from other members resulted in the creation of a document with six such examples, with links to guidelines and contact details for more information. Another discussion on open access resulted in a group of four librarians connecting on the role of libraries in KMb and a librarian from York University providing input into the work of librarians at the University of British Columbia.

Each initiative offers a different way of engaging with the RIC network, including more traditional transfers of information (webinars) as well as exchange-based interactions (KMb
Tools, KMbuddy, Dr. RIC). While there are many anecdotes of individual RIC members benefitting from the expertise of another, anecdotes are not evidence. RIC’s evaluation captures not only quantitative data on the reach and use of its initiatives but also narratives of how participation in RIC has created value for its members.

**Methods**

A case study evaluation (Russell, Greenhalgh, & Kushner, 2015) provided the overarching methodological approach of this study. The major advantage of a case study evaluation is accessing the “potential for communicating in ways that match how people learn, to promote the likelihood that they will engage with the findings” (Simons, 2015, p. xii). With RIC as the global-level unit of analysis, this methodology recognized that while the formal generalization of findings was not possible, lessons emerging from the ongoing evaluative efforts are likely to have informative value for the collective process of knowledge accumulation in the impact field.

**Evaluation Framework**

A developmental approach (Patton, 2011) was adopted for this case study evaluation in order to support RIC’s efforts to build institutional capacity for KMb in order to aid and accelerate impact. Developmental evaluation recognizes the collaborative, complex, and evolving nature of change processes (Preskill & Beer, 2012) and the important role participants can play in goal setting (Patton, 1994). The overall goal of the RIC evaluation is to inform and support continuous improvement, adaptation, and intentional change in the complex, dynamic environments of RIC as it pursues its vision. The goal of this study was to explore how RIC’s activities to build capacity for KMb have contributed to the professional development of its internal membership.
A co-produced evaluation framework (see Appendix A; Bergen, 2019) was central to this work. The first element of the evaluation framework was a logic model linking the evaluation questions to RIC’s audiences, enabling conditions, common activities, short- and long-term outcomes, and vision. It was important for the logic model to represent the diversity of RIC’s member institutions, which are organized to respond to local and regional issues (McKean & Robbins, 2016). The second element of the framework was a measurement overview linking elements of the logic model to data collection and analysis methods that were (a) flexible enough to have utility between member institutions and (b) feasible given the resource constraints of RIC and its member institutions.

Data Collection and Analysis

Methods for data collection and analysis followed a convergent design (Creswell & Plano Clark, 2018), wherein quantitative and qualitative data were collected concurrently, analyzed separately, and then merged for comparison and integration (Li et al., 2000). This approach supported the pragmatic orientation (Feilzer, 2009) of the evaluation that sought “to draw from the strengths and minimize the weaknesses” (Johnson & Onwuegbuzie, 2004, pp. 14-15) of quantitative and qualitative data when forming inferences about RIC’s approach to building institutional capacity for KMb.

A survey was administered to all member institutions with internal RIC leaders able to respond (N = 14), which included members who held a position in the oversight of RIC’s activities and the strategic planning of the network. Sixteen responses were received (two institutions had two respondents each). Respondents held a variety of institutional positions (e.g., manager of KMb, coordinator of strategic research initiatives), with approximately half situated in a research services office and the remainder positioned to support community-based research,
large-scale research programs, and research centres or libraries. Two instruments were adapted for use in the survey: (a) Edelstein’s (2016) instrument for studying collaborative research partnerships for KMb and (b) Penny Cooper & Associates’ (2017) instrument, developed for the evaluation of the Michael Smith Foundation for Health Research. Whereas the first instrument provided measures to explore factors affecting the development and success of collaborations structured around research use and impact, the second provided measures to explore the extent to which network activities were contributing to institutional KMb capacity. Owing to this synthesis, the survey employed in this study featured both 4-point and 5-point Likert-type scales. The organizing concepts of usefulness and use described by Penny Cooper & Associates (2017) were focal points. Usefulness referred to how RIC’s activities were perceived in terms of their appropriateness, applicability, and practicality. Use referred to how RIC’s activities have contributed to institutional KMb practices, including contributions to awareness, knowledge, skills, and positive attitudes about KMb. Prior to its distribution, the survey was piloted with several researchers with expertise in program evaluation and KMb.

Analysis of the quantitative data involved descriptive statistics and correlation analysis. Given the small sample size, statistical generalizations to a defined population were not made. Instead, the focus was on how concepts in the KMb and impact literatures helped in understanding and explaining observed findings (i.e., analytic generalizations; Onwuegbuzie & Collins, 2007). Analysis of the qualitative data followed a general inductive approach (Thomas, 2006) comprising four iterative steps: (a) the thematic coding of text segments, (b) synthesizing codes to form categories of consolidated meaning, (c) recoding and recategorizing as more

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4 Edelstein’s survey iterates on two well-established instruments from the health-promotion field: a) the self-assessment survey of the Center for the Advancement of Collaborative Strategies in Health (2002), and b) the Community Impacts of Research Oriented Partnerships measure (King et al., 2003).
attuned perspectives on patterns in the data were developed, and (d) synthesizing categories to identify underlying concepts within the data through a process of integration and refinement. Once each data set had been fully represented in meaningful ways, findings were merged to enable the identification of key features being converged upon. Respecting the developmental approach of the RIC evaluation, input and involvement of the RIC membership was critical at this stage in order to ascertain how emerging findings could be interpreted in the light of different institutional contexts, affirm current practices or inform new activities, and guide strategic questions regarding RIC’s successes and challenges (Preskill & Beer, 2012). Moreover, interpreting findings in collaboration with RIC as the unit of analysis aimed to support the organization in “becoming more adaptable to the uncertain and unpredictable dynamics of complexity” (Patton, 2016a, p. 6). Several feedback loops (summarized below) between the evaluation team and different RIC committees framed this process.

- April 2019: Emerging findings are shared with the RIC Governance Committee, resulting in refinements to how findings could speak to the RIC network at large.
- May 2019: Findings are shared with the RIC Evaluation Committee, with a major focus on the factors that might explain survey participants’ qualitative and quantitative responses.
- July 2019: A second meeting is held with the RIC Evaluation Committee involving the final review, analysis, and clarification of findings; a discussion of the implications for the RIC network; and planning for how findings would inform later phases of the developmental evaluation.
September 2019: Findings, implications, and future evaluation plans are shared with the full RIC membership at their annual in-person meeting, providing an opportunity to discuss the implications and to share feedback on next steps.

**Findings**

Findings are presented in relation to the research questions, with emphasis given to the results converged upon by the quantitative and qualitative analyses, and refined through the feedback loop process. Note that findings crystallized throughout the feedback loops are identified using a bracketed “FL.” The findings begin with a look at the institutional and network contexts of RIC in order to characterize subsequent findings. Note that “members” is used throughout as a label for participants to convey their membership in the RIC network.

**Institutional and Network Contexts for KMb**

**Institutional Factors**

Within member institutions, a variety of labels were used when members were asked to describe their institutional role. The most common roles were KMb support for grant applications ($n = 10$), knowledge broker ($n = 9$), research communication ($n = 8$), and community/public engagement ($n = 7$). Other roles, such librarian and knowledge stewardship ($n = 1$), were relatively uncommon and independently endorsed. On average, members identified with three roles. Phi product moment correlations indicated two statistically significant, strong associations between (a) knowledge broker and community/public engagement ($r = .778, p = .002$) and (b) KMb support for grant applications and research communication ($r = .516, p = .039$). In other words, it appeared that members viewed their institutional roles as multifaceted and thus not fully represented by one-dimensional labels.
Members were also asked to indicate the extent to which they possessed sufficient resources for their work with RIC. Reflecting the prevalence of KMb training among the sample—with all but three having completed formal training—most members agreed\(^5\) they possessed the necessary skill set for KMb \((n = 12)\) as well as the institutional support needed for engaging with the network membership \((n = 10)\). In contrast, half \((n = 8)\) of the membership felt ill-equipped when it came to tools for KMb, and only two members felt they had sufficient time for engaging with others in the network. Yet, that network activities on occasion conflicted with other scheduled commitments was not the sole time-related challenge; time was also a challenge in staffing constraints and turnover (e.g., changes in institutional leadership), as reflected in one member’s desired future influence of RIC: “It has added an extra 1/3 FTE [full-time equivalent] load, at a time when my unit has lost 1 FTE … [so] I would hope for a dedicated FTE as KMb broker and RIC Liaison.” Due to the incidence of staff mobility within member institutions, and thus the time required to rebuild institutional capacity for KMb, preserving institutional learning for KMb was an ongoing challenge.

Expanding on the importance of institutional learning, several associations between reported resources and the attributes of member institutions were examined. Spearman’s rank-order correlation revealed that the duration of membership with RIC exhibited a statistically significant, strong positive correlation with both KMb skills \((r_s = .637, p = .008)\) and KMb tools \((r_s = .650, p = .006)\). That is, members’ perceptions that they possessed sufficient KMb capacity were positively related to the length of time their institution had been involved with RIC. Conversely, membership duration was not statistically significantly correlated with the institutional support or the time available for KMb work, suggesting these resources have been

\(^5\) “Agreed” throughout corresponds to the Likert-item responses agreed and strongly agreed?
less amenable to change. A point to emphasize here is that KMb skills and KMb tools are resources within each member’s control (i.e., not necessarily restricted by an institution), whereas institutional support and time are institutionally bound resources (FL).

**Network Factors**

Factors characterizing RIC’s work between member institutions were also examined (see Table 2.1), uncovering a division in network functions with higher and lower levels of endorsement. Specifically, it appeared the four functions with the highest level of endorsement corresponded to efforts to share leadership and generate engagement among the membership. Conversely, it appeared the remaining functions corresponded to efforts likely to differ according to each member institution. Providing some perspective on this finding, participants discussed how an expanding network of member institutions had precipitated an unexpected challenge: “A growing membership has reduced the one-on-one calls and interactions among members.” This change in interactions was echoed by others, who identified that “growing the network [and] increased membership, particularly from U15s [15 of Canada’s most research-intensive universities]” had been both a boon and a challenge for network learning. Members further referenced how the increasing variance in member institutions’ KMb needs had the effect that “it is not always easy to adapt the practices of other members.” As such, as a network of diverse institutions, it had become increasingly important that the sharing of “what works” was accompanied by an exposition of why it worked in a particular context (FL).

<table>
<thead>
<tr>
<th>Network Function</th>
<th>M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engage all members in network activities</td>
<td>3.60(0.51)</td>
</tr>
<tr>
<td>Include members in decision-making processes to move the network forward</td>
<td>3.60(0.63)</td>
</tr>
<tr>
<td>Recognize the value of each member</td>
<td>3.46(0.52)</td>
</tr>
<tr>
<td>Minimize the barriers to being involved in the network</td>
<td>3.38(0.51)</td>
</tr>
</tbody>
</table>
Align its activities with the memberships’ needs 3.15(0.69)
Work together to address the needs of its target audiences (e.g., researchers) 2.86(0.86)
Work to match the goals of the different institutions 2.54(0.93)

Note. Factors were scored on a 4-point scale, with 4 being the highest value. M and SD represent mean and standard deviation, respectively.

Additionally, when members described how the sharing of information about KMb was occurring, both instrumental (i.e., related to work tasks) and expressive (i.e., not related to work tasks) relations were described. Instrumental relations included advice seeking, collaboration, the exchange of best practices, the exchange of tools and resources, and the exchange of new ideas. Expressive relations included social support and energy exchange (i.e., interactions that leave an individual feeling more positive, inspired, and motivated; Daly et al., 2016). Given the importance members assigned to these different ways of interacting, capacity building for KMb appeared to be multi-relational activity.

Usefulness of a Networked Approach to Building Institutional Capacity for KMb

As a proxy for the perceived value of specific KMb activities, members were asked to report on the usefulness of RIC’s networked approach to building capacity for KMb as well as how its activities have contributed to their conceptual development around KMb (see Table 2.2). Usefulness was examined using four indicators, which together suggested that network activities were well received. Yet, while members were highly consistent (Cronbach’s $\alpha = .909$) in their responses, the relevancy of network learning was a point of some disagreement. One member, for example, discussed an instance in which their specific, immediate KMb needs misaligned with the topical schedule of network activities, though stressed that “this difficulty should not reflect negatively on [RIC]. RIC seems to be serving those whose positions plant them firmly in the knowledge brokerage space quite well.” Others, however, found those same activities to be highly relevant for their KMb work. These differences appeared to speak to the ebb and flow of
relevancy in network learning opportunities in light of member institutions with different KMb goals, audiences, and needs.

Indicators for members’ conceptual development around KMb were observed to be predominately positive, suggesting growth in knowledge about KMb tools and resources as well as in understanding, attitudes, and confidence. For example, reflecting on the influence of network membership on day-to-day work, one member expressed how involvement “makes me more confident in my discussions about KMb with faculty and admin. I also have a better plan of action to improve KMb practice on campus.” Notwithstanding similar evidence of growth, a divide between developments in KMb theory and practice was noted (FL), echoing other recent studies of KMb in research organizations (e.g., Powell et al., 2017, 2018). Specifically, while members extolled their “greater understanding of KMb in the university setting,” they were less certain about improvements in their understanding of KMb theory.

Table 2.2
Descriptive Statistics for Members’ Perceptions About the Usefulness of Network Activities

<table>
<thead>
<tr>
<th>Measure and Associated Indicators</th>
<th>M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perceived Usefulness</strong> – The KMb topics I have been engaged in with Research Impact Canada:</td>
<td></td>
</tr>
<tr>
<td>Met my expectations</td>
<td>4.31(0.48)</td>
</tr>
<tr>
<td>Were of high quality</td>
<td>4.23(0.60)</td>
</tr>
<tr>
<td>Resulted in learning that I was able to apply</td>
<td>4.00(0.76)</td>
</tr>
<tr>
<td>Were relevant to my current work</td>
<td>3.93(1.10)</td>
</tr>
<tr>
<td><em>Internal consistency</em></td>
<td>.909</td>
</tr>
</tbody>
</table>

**Conceptual Development** – My participation in Research Impact Canada has led to specific improvements in:

<table>
<thead>
<tr>
<th>Measure and Associated Indicators</th>
<th>M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My awareness of available tools and resources related to KMb</td>
<td>4.36(0.50)</td>
</tr>
<tr>
<td>My understanding of KMb practices</td>
<td>4.36(0.63)</td>
</tr>
<tr>
<td>My attitude toward KMb</td>
<td>4.13(0.83)</td>
</tr>
<tr>
<td>My confidence in enacting KMb practices</td>
<td>4.00(0.95)</td>
</tr>
<tr>
<td>My understanding of KMb theory</td>
<td>3.67(0.82)</td>
</tr>
<tr>
<td><em>Internal consistency</em></td>
<td>.820</td>
</tr>
</tbody>
</table>

Note. All measures were scored on a 5-point scale, with 5 being the highest value. M and SD represent mean and standard deviation, respectively.
When asked to think ahead to future participation, members expressed several suggestions for how network activities could be made more useful, including exploring KMb topics in greater depth; creating opportunities for members to collaborate on specific KMb products and on network development (e.g., developing a collective statement on tenure and promotion that accounts for the importance of KMb); and developing processes that support members in importing and adapting KMb practices, ideas, tools, and resources found to be effective in other institutions (FL). The sentiment was that a focus on these suggestions would serve to further catalyze the use of KMb concepts in practice.

**Use of KMb Concepts in Practice**

The final dimension of the survey explored how RIC’s members have used concepts from network learning about KMb in practice. Given the challenges associated with studying how evidence is used (e.g., in the case of research evidence, see Gitomer & Crouse, 2019), findings presented in this section should be taken as indications of use rather than conclusive evidence.

The first measure of use included three brokering-specific indicators (see Table 2.3). Consistent with the finding that not all members identified with the role of knowledge broker, few (between \( n = 1 \) and \( n = 5 \)) agreed with the indicators of this measure. Even so, members’ responses about brokering-specific use were highly consistent (Cronbach’s \( \alpha = .959 \)) and found to be a strong positive correlation with formal membership duration \( (r = .793, p = .002) \) as well as a moderate positive correlation with perceptions of usefulness \( (r = .642, p = .025) \) and perceptions of conceptual development \( (r = .688, p = .013) \). The association with membership duration was expanded in the open-ended responses of four members who reported that it was “too soon to tell” whether network learning about KMb will have influence on their brokering of connections between researchers and research stakeholders. As one member observed, though,
participation in a respected and recognized KMb network had “supported discussion with institutional leaders around the value of the KMb brokering role(s) within the university.” What can be said about the brokering-specific use of KMb concepts is that it appears benefits from network learning have accrued most notably in the long term and when activities have been perceived as useful (FL).

Table 2.3
Descriptive Statistics for How Network Activities Have Contributed to Members’ KMb Practice

<table>
<thead>
<tr>
<th>Measure and Associated Indicators</th>
<th>M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use – Brokering-Specific</strong> – My participation in Research Impact Canada has led to specific improvements in:</td>
<td></td>
</tr>
<tr>
<td>The quality of interactions I have brokered between researchers and research users</td>
<td>3.42(0.79)</td>
</tr>
<tr>
<td>The types of interactions I have brokered between researchers and research users (e.g., research development interactions, dissemination interactions)</td>
<td>3.08(0.79)</td>
</tr>
<tr>
<td>The frequency of interactions I have brokered between researchers and research users</td>
<td>2.75(0.62)</td>
</tr>
<tr>
<td><strong>Internal consistency</strong></td>
<td>.959</td>
</tr>
<tr>
<td><strong>Use – General</strong> – Within the past 12 months, how well has Research Impact Canada:</td>
<td></td>
</tr>
<tr>
<td>Generated increased learning opportunities related to KMb</td>
<td>3.25(0.62)</td>
</tr>
<tr>
<td>Provided professional development opportunities</td>
<td>3.18(0.60)</td>
</tr>
<tr>
<td>Used information and materials provided by the membership for decision-making purposes</td>
<td>3.17(0.72)</td>
</tr>
<tr>
<td>Enhanced the importance of KMb practices</td>
<td>3.15(0.55)</td>
</tr>
<tr>
<td>Increased the body of knowledge you have for making informed decisions about KMb practices</td>
<td>3.15(0.69)</td>
</tr>
<tr>
<td>Enhanced the potential for greater impact from your work with target audiences (e.g., researchers and research users)</td>
<td>2.70(0.67)</td>
</tr>
<tr>
<td>Helped your institution bridge the gap between research, policy, and practice</td>
<td>2.38(0.92)</td>
</tr>
<tr>
<td><strong>Internal consistency</strong></td>
<td>.880</td>
</tr>
</tbody>
</table>

*Note. General use measures were scored on a 4-point scale, with 4 being the highest value; brokering-specific use measures were scored on a 5-point scale, with 5 being the highest value. M and SD represent mean and standard deviation, respectively.*

The second measure of use included seven general indicators (see Table 2.3). In contrast with brokering-specific use, members agreed with the content of five of these indicators, suggesting that network learning has spurred some use of KMb concepts in practice. Responses to these indicators were highly consistent (Cronbach’s α = .880) and found to be moderately
positively correlated with perceptions of conceptual development ($r = .596, p = .024$) and strongly positively correlated with perceptions of usefulness ($r = .788, p < .001$). Again, it appeared that attention to the perceived usefulness of network activities was an important precondition for the extent to which KMb concepts were used in practice. Members’ open-ended responses shed light on what some of these general uses have looked like:

- an improved ability to implement KMb into day-to-day work (e.g., “I am able to develop more theoretically sound KMb plans and integrate them into projects more thoroughly”);
- the “sensitization of the [institutional leaders] and the direction of some departments to the importance of knowledge mobilization”;
- the dissolution of feelings of isolation, replaced by enthusiasm for “being part of a national movement”;
- an expansion of institutional perspectives on KMb through enabling “a look at the broader knowledge mobilization picture,”
- improved access to and awareness of useful KMb concepts (e.g., “I have been able to access insight, tools, and resources that have had a direct and positive impact on my work,” and “[participation] has simply made me better at my work”); and
- bolstered authority as an ambassador for KMb, owing to the international image of RIC as an active and reputable KMb network.

On the other hand, many members once again emphasized that it was “too soon to tell” how network learning will lead to specific uses of KMb concepts in practice. This finding was most evident for the items that asked whether participation has enhanced the potential for greater impact from your work with target audiences and whether participation has helped your institution bridge the gap between research, policy, and practice. Yet, considering the long-term
nature of impact and of bridging specific divides between different research stakeholders (Boaz et al., 2019; Nutley et al., 2007), the protracted and non-linear nature of these types of use is to be expected.

As a final point of reflection, members were asked to think ahead to outcomes they were hoping to see from network participation in the years to come. Three main outcomes were described (FL): increased buy-in from institutional leadership in terms of dedicated resources (predominately time); improved and sustainable sharing of knowledge and resources among member institutions; and a strengthened profile of KMb among researchers and stakeholders, particularly researchers (e.g., “We would like to use our membership to create a campus network of KMb”).

Discussion

Findings from this study provide initial empirical evidence of the benefits and challenges associated with a networked approach to building institutional capacity for KMb in a mission-driven impact system. Participants were clear in their views that participation in the RIC network of universities had contributed to their KMb practice. At the same time, considerable variability was observed regarding the extent to which network learning was useful and what use looked like. Two overarching themes from this study can be understood in light of pertinent ideas from the KMb and impact literatures.

First, the contextual variability in how institutions engage in KMb work was accentuated through a networked approach to capacity building. For some time, the contextual dependence and variability of those working in KMb roles has been recognized (e.g., Cooper, 2014, Greenhalgh et al., 2004; Urquhart et al., 2011). The specific KMb goals and needs of institutions are necessarily dynamic to their local issues and constraints. Considering the identified roles of
participants in this study as well as the correlations among those identifications, there was evidence that KMb needs aligned with two broad categories of methods for creating impacts (Bayley & Phipps, 2019a): (a) dissemination or transfer methods (i.e., roles aligned with communication and grant-support aspects of KMb), and (b) co-production or engaged methods (i.e., roles aligned with brokering and engagement aspects of KMb). The effect of this need diversity was that initiatives targeted at the whole network were at times askew with the specific KMb needs of individual institutions, as reflected in the relevancy of network learning, which exhibited the lowest mean and greatest variance of the indicators for usefulness. Moreover, although some members seemed aware of the diversity of KMb practices in other institutions (particularly those with more experience in the network), it was a challenge to understand how to collaborate effectively with other institutions or import practices in ways that attended to differences in context. This point speaks to the finding that increasing network diversity was both a boon and a challenge; greater diversity can mean greater access to ideas and resources as well as increased potential for innovation (Shearer et al., 2018), yet harnessing that diversity requires a substantive time commitment and support across multiple levels (local, organizational, network).

An opportunity to address this challenge could be to explore how practice-based subgroups can support the diverse needs of different institutions concurrently with the broader vision of the network. Recent study of network concepts applied to KMb suggests that linked subgroups have the potential “to establish an environment more conducive to change” (Glegg, Jenkins, & Kothari, 2019, p. 22). By drawing on a framework for the diversity of KMb approaches—such as Davies et al.’s (2015) eight KMb archetypes (e.g., producing research-based knowledge products, brokering, and intermediation)—networked institutions are
positioned to explore (a) how subgroups focused on specific KMb approaches can accelerate capacity building and improve the relevancy of network activities, and (b) how subgroup learning can expand the pooled KMb capacity of the whole network. Relatedly, it would be important to explore the network systems and structures required to facilitate flows of KMb-related information and resources within and between practice-based subgroups.

Second, benefits that accrue from network learning at the institutional level need to be attuned to how that capacity is distributed among individuals and groups within institutions. Summarizing the work of a number of organizational and network learning scholars, Omar Belkhodja et al. (2007) observe that

the transition from individuals to the organization seems … to stem from two main elements: first, the incorporation of knowledge into organizational memory, structures, and routines; and second, the usefulness of the knowledge as perceived by the individuals who make up the different organizational units. (p. 389)

Similarly, emerging work that blends KMb, complexity, and network concepts (e.g., Beckett et al., 2018; Kitson et al., 2018) calls to question how capacity building across multiple levels of research systems can be mutually reinforcing. In the case presented here, a challenge was to ensure that network learning was preserved and iterated upon in order to contribute to institutions’ long-term KMb goals. For example, time constraints critically impacted participants’ ability to understand, import, and adapt KMb tools from other institutions. Building institutional capacity for KMb through a networked approach required being self-referential to the ways knowledge is sourced, validated, shared, interpreted, and employed. In this way, RIC is mobilizing knowledge about KMb. It stands to reason that a topic deserving further exploration is how building institutional capacity is reinforced by paying attention to the capacity of
individuals and groups within institutions. In relation to the skills (i.e., impact competencies; Bayley et al., 2018; Bayley & Phipps, 2019b; Mallidou et al., 2018) and knowledge (i.e., impact literacy; Bayley & Phipps, 2019a, 2019b) needed to support impact, future studies could explore how individual and institutional impact competencies and literacies can work synergistically to support impact pathways.

Limitations

A perennial threat to valid interpretations in self-report data is social desirability (Gitomer & Crouse, 2019). It is possible that participants in this study responded in a way they thought would be viewed positively by others. Thus, similar to other self-report studies of KMb within research institutions (e.g., Zuiker et al., 2019), these findings cannot be viewed as complete or accurate portrayals of changes to institutional capacity for KMb. However, despite its limitations, self-report data about KMb practices does offer a functional starting point for the more in-depth analysis of specific actions (Cooper & Levin, 2010).

Another limitation is that, in the case of simple quantitative measures, a clear line between the organizing concepts of usefulness and use is blurred. For this reason, the measures and indicators of either concept do not necessarily constitute an objective instrument; rather, in combination with the qualitative data, quantitative findings are taken as indicative of patterns in the data to be examined in greater depth in subsequent study.

Finally, it is important to reiterate that findings from this study are not generalizable, given the case study evaluation design. At the same time, however, insights from this study are informative when viewed against the wider KMb and impact literatures and provide a useful basis for future research. For instance, the opportunity for practice-based subgroups has already entered a pilot phase and generated progress within the RIC network.
Conclusion

This study provides some of the first empirical evidence about a sustained networked approach to building institutional capacity for KMb. While examples abound of networks that seek to build capacity to support impact in a specific discipline, the case examined here provides a first look at the potential benefits and challenges of network learning across universities in a mission-driven research system. Future research will build on this study by examining in greater detail how network efficiency can be enhanced and how institutional learning can be preserved.
Chapter 3

Network Learning for Knowledge Mobilization:
Universities and the Pursuit of Research Impact

Preamble

This third chapter presents key findings from Phase II of Research Impact Canada’s (RIC) developmental evaluation (DE). It directly builds upon Phase I and presents an in-depth analysis of participants’ experiences with and perspectives on (a) institutional KMb efforts, and (b) participation in the Research Impact Canada network (practice and empirical contributions). Similar to Chapter 2, I led the design of this research, all data collection and analysis procedures, and co-wrote the paper with Dr. David Phipps (Network Director, Research Impact Canada; Assistant Vice President, Research Strategy and Impact, York University).

Introduction

Universities hold a critical role in equipping societies to overcome local and global challenges (Hall & Tandon, 2021). Their historical functions as societal institutions trace back to the earliest models of higher education (Benneworth et al., 2018), and recent decades have seen a confluence of social forces drive new expectations for how universities contribute to the public good (Calhoun, 2006; Kokshagina et al., 2021). Most notably, higher education policy environments have put universities and researchers under increasing pressure to conceptualize and demonstrate how public research investments lead to impacts beyond the academy (Budtz Pedersen et al., 2020; Reale et al., 2018; Smit & Hessels, 2021).

Research impact refers to the “demonstrable and/or perceptible benefits to individuals, groups, organisations and society (including human and non-human entities in the present and future) that are causally linked (necessarily or sufficiently) to research” (Reed et al., 2021, p. 3).
As interest in assessing impact has grown, so too have efforts to improve institutional infrastructure and activity to achieve impact (e.g., Bogenschneider, 2018; Wye et al., 2019), a field of inquiry called knowledge mobilization (KMb). However, while various practice-based networks have been established to share insights about how carry out these efforts, there is a critical need for empirical research into the institutionally embedded professionals who facilitate KMb and their professional networks that aim to build capacity at scale. Without an understanding of the experiences and perspectives on how universities can position themselves effectively regarding KMb, the potential to achieve impact may be circumscribed to traditional practices ill-suited for the complexity of modern issues.

In this article, we investigate the efforts of RIC, a pan-Canadian professional network that aims to build institutional KMb capacity. Our analysis derives from a DE of RIC to support the network’s ongoing adaptation to changing conditions (e.g., institutional priorities), emerging understandings about how to effectively facilitate KMb, and an expanding membership. Given that RIC is one of the only professional networks that targets capacity building at the institutional level, this study provides new insights into how such networks can flourish despite tensions that would otherwise spell fragmentation. The following research questions guided our inquiry:

1. What are the network learning experiences of institutionally embedded professionals who facilitate KMb?
2. How can network learning to develop institutional KMb capacity be structured to improve the use of KMb concepts in practice?

**Knowledge Mobilization and Research Impact in Canada**

In Canada, interest in KMb has burgeoned since the late 1990s (Holmes & Strauss, 2019). With roots in several prominent programs of research (see Cooper & Levin, 2010),
activity in this field of inquiry is now manifold by comparison, reaching across sectors and stakeholder groups (e.g., Cooper et al., 2018; Nguyen et al., 2020). Perspectives on what KMb encompasses have similarly expanded. Davies et al. (2015), for instance, describe eight archetypes of KMb practices, with each presenting different challenges, strengths, and situational appropriateness. Considered alongside the general consensus that KMb and impact are contingent on social, spatial, and temporal circumstances (Reed et al., 2021), rendering a comprehensive picture of KMb in Canada is complicated. Nevertheless, several broad characterizations can be drawn.

Beginning with the overarching provincial and federal levels, governments and research funders are intensifying expectations that publicly funded research demonstrates a return on investment for Canadian citizens (Veletanlić & Sá, 2019; Bayley & Phipps, 2019). While there currently exists no widespread impact assessment exercises like those in the UK or Australia (see Williams & Grant, 2018), Canada is nonetheless implicated in the “performance and audit culture” (Chubb & Watermeyer, 2017, p. 2362) washing over national research systems. Instead of ex post assessments of impact, funding programs in Canada have traditionally incentivized researchers and their institutions to develop ex ante descriptions of how funded research will contribute to downstream impacts (MacGregor et al., 2021). However, there are some recent moves towards performance-based funding, where research outputs and outcomes are evaluated at a national or sub-national level to determine the distribution of research funding (Hicks, 2012). In Ontario, for example, the provincial government has introduced new performance-based funding agreements with all post-secondary institutions that will raise the current 1.4% in operating funding tied to performance to 60% by 2025 (Ministry of Colleges and Universities, 2021). The agreements employ 10 metrics organized into two categories: skills and job
outcomes, and economic and community impact. This latter category includes four metrics that target the broader impacts of publicly funded research:

a) Research funding and capacity for universities, and apprenticeship-related for colleges;

b) Research funding from industry sources/funding from industry sources;

c) Community/local impact of student population; and

d) Economic impact (institution-specific).

Notwithstanding the challenges of metric-based impact measurement (see Wilsdon et al., 2015), the drift towards heightened accountability is set against a higher education sector grappling with various social, environmental, and economic uncertainties (e.g., anomalously low federal research spending compared with other OECD countries; Naylor et al., 2017).

At the institutional level, universities have traditionally made societal contributions through their education and research activities (i.e., their two traditional missions; Miller et al., 2014). Recently, though, their engagement with society has grown (Benneworth et al., 2018), and KMb is increasingly viewed as a core aspect of the third mission of modern universities (Laredo, 2007). Until recently, institutional efforts to produce and share research primarily focused on generating economic impacts via technology transfer (Carl & Menter, 2021) and rational-linear models of how research gets used in policy and practice (Davies et al., 2015). Contemporary support for KMb emerged not only in response to the limitations of these earlier approaches, but also various external pressures. To name a few, universities are contending with myriad other knowledge producers vying for public attention and funding (e.g., think tanks; Cain et al., 2018), growing (inter)national competition with other universities on performance metrics (Wilsdon et al., 2015), and increasingly complex and far-reaching societal challenges that necessitate diverse stakeholder involvement (Bednarek et al., 2018). However, concomitant
institutional efforts to facilitate KMb have not progressed without challenges. Some of the most notable include:

- limited understanding of KMb and how to prioritize, action, and evaluate it in diverse local and organizational contexts (Davies et al., 2015; Naidorf, 2014; Powell et al., 2017; Ward et al., 2012);

- insufficient institutional support services, funding, coordination, and leadership for KMb (Kalbarczyk et al., 2021; Miller et al., 2014; Sá et al., 2011), as well as few researchers accessing available resources (Cooper et al., 2018); and

- identities, values, and purposes often misaligned with the cultural and structural changes triggered by the increasing emphasis on KMb and impact (Sá et al., 2011; Reed & Fazey, 2021).

Building upon current understandings of the abovementioned circumstances is critical for advancing how universities engage with society. An essential complement to that work is studying the individuals and groups embedded within universities who drive KMb.

**Facilitation and the Human Force Behind Knowledge Mobilization**

Many scholars have stressed the need for skilled professionals who can mediate connections between research production and use contexts (Bayley & Phipps, 2019a; Jessani et al., 2018; Wye et al., 2019). As “the human force behind [KMb]” (Ward et al., 2009, p. 267), their roles take varied forms depending on who is included, where they are positioned in social systems, what they do and how (Bayley & Phipps, 2019b, Neal et al., 2021). The variety of possible roles has led to a situation similarly set off by the abundance of KMb frameworks and models: the limited accumulation of insights about KMb as professional practice (Davies et al., 2015; Powell et al., 2018).
As a step towards addressing this issue, we employ the overarching concept of *facilitation*, a technique by which a person, group, or organization “makes things easier for others . . . [by providing] the types of support required to help people change their attitudes, habits, skills, ways of thinking, and working” (Kitson et al., 1998). Although earlier research has considered what roles and characteristics fall under the banner of facilitation (e.g., Cranley et al., 2017), there are few examples of its application to the study of complex systems comprising multiple KMb professionals working with diverse audiences across nested contexts.

**Conceptual Framework**

To investigate the phenomena of network learning to advance KMb practices, this study draws on the integrated Promoting Action on Research Implementation in Health Services (i-PARIHS) framework (Harvey & Kitson, 2016; Kitson et al., 2008). Although its original formulation is over two decades old, the i-PARIHS framework’s applicability to the study of “whole system change implicating both the individual and organisation” (Kitson et al., 2008, p. 2) continues to be illustrated (e.g., Cranley et al., 2017; Mallidou et al., 2018; Li et al., 2018; Powell et al., 2017). Much of its appeal and usability stems from a parsimonious coverage of key constructs for understanding the success or otherwise of approaches to implementing evidence-informed change. In the i-PARIHS framework, successful implementation (SI) is a function of “facilitation [Fac^n], innovation [I], recipients [R] and context [C], with facilitation represented as the active element assessing, aligning and integrating the other three constructs” (Harvey & Kitson, 2016, p. 2). This relationship among constructs is commonly represented as follows: SI = Fac^n(I + R + C).

The facilitation construct is particularly significant in the phenomenon of network learning among KMb professionals. As described for the human-driven aspects of KMb,
facilitation is the how of achieving systems change, encompassing both a set of actors and the processes they employ (Kitson & Harvey, 2016). Harvey and Kitson (2016) suggest that facilitation is characterized by uncertainty and nonlinearity and hence there is a “need for facilitators to work within a supportive network, ideally mentored and supported by peers and more experienced colleagues” (p. 7). They go on to detail the skills and experience that might characterize expert, experienced, and beginner or novice facilitators, indicating that each has a role in supporting the professional development of more junior facilitators in their network. Within this framing, success is viewed not only in the sense of outcomes and impacts from specific initiatives, but also the collective progression towards systems change. Facilitation provides the focal point of this study.

Methods

The design for this study is rooted in the principles of DE (Patton, 2016a, 2016b), an approach to evaluation that supports the development and administration of innovations in complex systems. In this study, the DE was designed to inform the ongoing development (Patton, 2011) of RIC’s approach to building institutional KMb capacity. DE “does not rely on or advocate any particular evaluation method, design, tool, or inquiry framework” (Patton, 2016a, p. 10); instead, developmental evaluators devote attention to “experimenting, adapting and developing what they do in response to program participants’ feedback, changing conditions, new insights, and emerging challenges all around them” (Patton, 2011, p. 41). Co-creation is thus a central tenet of DE, which for this study involved the external evaluator (lead author) joining RIC’s Evaluation Committee.
Evaluation Context

Founded in 2006 through a SSHRC/CIHR Intellectual Property Mobilization grant, RIC has grown from a two-university collaboration into a network of 21 universities (20 in Canada plus the University of Brighton, UK) whose KMb efforts rank among the most impressive in Canada (Cooper, 2014). The network’s activities have been likened to “a community of practice for research mobilization and includes knowledge brokers, researchers, and other practitioners looking to exchange information on best practices, past successes, and future directions” (McKean & Robbins, 2016, p. 6). Target audiences for the network’s activities include its internal members (e.g., network contributors within each institution), the university partners with whom they share institutional settings (e.g., faculty, graduate students), and other partners external to the network’s member universities (e.g., non-RIC universities, other KMb networks, funding agencies). Intended short- and long-term outcomes for these audiences ultimately advance the network’s vision, which is to become “a globally leading network which supports researchers, students and their partners to demonstrate the contribution to and impact of research excellence” (RIC, 2018).

Data Collection

The DE began in late 2018 and has since integrated multiple quantitative and qualitative data sources, including event data (e.g., dotmocracy activities during the annual meeting), surveys, field notes, organizational documents, and interviews. The primary focus here concerns the semi-structured interviews that occurred between December 2019 and April 2020. A total of 20 key informants from 15 of the (at the time) 17 RIC member institutions participated in the interviews, which were conducted using the Zoom videoconferencing software. Participants’
professional characteristics were systematically investigated before (via institutional websites) and during the interviews in order to probe their skills and experience in detail:

- All were professional staff, with nine having KMb in their job titles (e.g., Manager of KMb) and others having aspects of research communications, strategy, partnerships, exchange, or engagement;
- All but one worked under the leadership of a vice-president, research (or equivalent role);
- 17 stated KMb was the main concept used in their work, with the others using knowledge exchange, knowledge translation and transfer, or research impact; and
- They possessed medians\(^6\) of 2.8 years in their institutional role and 2.0 years with RIC.

Interviews lasted 60–90 minutes, and the semi-structured approach ensured that collected data were comprehensive and systematic, logical gaps in the data could be anticipated and addressed, and the common interview guide could be oriented to participants’ contexts (Adams, 2015; Patton, 2002). Each interview was audio recorded, transcribed, and supplemented with field notes about the study context and interviews that aided in developing rich descriptions of the experiences, perspectives, and contexts represented in the data (Phillippi & Lauderdale, 2018). The interview guide was developed in consultation with the Evaluation Committee and featured two groups of questions that explored (a) prominent themes that arose earlier in the DE for which more fine-grained data were needed, and (b) how RIC’s capacity-building activities have contributed to its members’ use of KMb concepts in practice (Penny Cooper & Associates, 2017). The guide was piloted with three scholars, each possessing expertise in KMb and program

\(^6\) Medians are reported rather than means, as these measures of professional experience exhibited non-normal distributions.
evaluation, leading to minor adjustments in phrasing and the addition of several questions (e.g., “What do people in your university seem most animated about in terms of KMb?”; Appendix C).

Data Analysis

Consistent with the DE approach, an iterative analytic procedure was employed to co-create meaning from the data, blending multiple feedback loops with different RIC actors to inform ongoing adaptation. To begin this procedure, the lead author and another KMb researcher independently used the constant comparative method (Glaser & Strauss, 1967), within and between an initial set of five interviews (Boeije, 2002), to inductively break down, examine, compare, conceptualize, and categorize the data (Strauss & Corbin, 1990). By reading and rereading the transcripts, making analytic memos, and identifying patterns and theoretical properties in the data, the analysis progressed from descriptive codes to categories of consolidated meaning to core themes (Thomas, 2006). Emphasis was placed on process coding and structural coding (Saldaña, 2015), which respectively refer to using gerund expressions to indicate action in the data (i.e., facilitation actions) and applying theoretical concepts relevant to the topics of inquiry. The analysts then met to scrutinize and compare their coding results, discuss interpretations, and develop a general coding scheme (DeCuir-Gunby et al., 2011) that captured high-level patterns in the data while allowing for continual refinement as the analysis progressed. As an example, one high-level structural pattern uncovered at this early stage addressed the tensions of network learning using a theoretical perspective adapted from the cross-sector collaboration literature (e.g., Bryson et al., 2015).

At this point (early May 2020), the lead author met with the RIC Network Director to discuss the coding and early insights as well as to strategize how emergent findings might be fed into existing processes. It is noteworthy that, at this time, the COVID-19 pandemic had severely
constrained the availability of all actors involved in the DE, and so broader stakeholder involvement was temporarily postponed. In the meantime, the lead evaluator completed the coding of all remaining transcripts while meeting with the Network Director regularly to discuss emerging findings, establish additional priorities for the analysis, and consider implications for the network. In July 2020, the RIC Evaluation Committee met to discuss an early draft of the findings, leading to further additions to the coding scheme and the re-coding of all transcripts to capture new areas of interest and refine major themes. The revised findings were then shared with RIC’s broader membership (N = 39) at the annual general meeting in September 2020 to provoke questions and areas for follow-up investigation. Ultimately, the findings presented herein resulted from continuous incremental feedback loops that continued after the annual meeting with the Evaluation Committee (November 2020 and January 2021), the Steering Committee (March 2021), and the Governance Committee (April 2021). Each feedback loop involved what Preskill and Beer (2012) described as “ongoing sense-making activities: interpreting, synthesizing, and generating insights and recommendations using multiple forms of written and verbal communications” (p. 8). As set out above, particular emphasis is given to lessons learned from RIC’s networked approach to building institutional capacity for KMb. To portray the full constellation of perspectives shared during the interviews, participants are distinguished in the illustrative quotations using a randomly assigned institution placeholder (e.g., A, B) and a number (e.g., A1, A2).

**Findings**

Our findings centre on the facilitation construct of the i-PARiHS framework. Three overarching themes surfaced in our analysis: (a) the diversity of approaches to KMb, and (b) the network’s ethos of impact, and (c) key tensions for network learning. As set out in Figure 3.1,
these themes are interconnected such that an increasingly diverse network must modulate and refine its characteristic spirit (ethos), leading to an improved ability to coordinate and activate stored capital (human and otherwise). At the same time, network learning in facilitation can only occur when key tensions on the network and its members are kept in balance.
Figure 3.1
Overview of the Coding Process
Diversity of Approaches to KMb

The RIC membership, both individuals and their respective institutions, displayed considerable diversity in their facilitation of KMb. At the individual level, each participant employed a different blend of professional skills and competencies depending on their professional roles and interests, the types of knowledge being mobilized, and the relevant audiences and their contexts. When asked about their primary job functions related to KMb, participants expressed how the answer “depends on the day” (A1), “depends on the [KMb] question that is asked” (K1), and “depends on what the project is . . . [and] who you’re working with” (C1). Such contextual dependence meant that individuals generally found it challenging to import insights from one project into another. In the words of an experienced network member, “it’s just so complex and messy and relationship based” (I1). For individual actors, facilitative actions rarely played out in predictable ways within a single local or organizational context; across networked universities, this variability expanded considerably.

Another area in which individual diversity emerged was language. Although 17 participants reported using KMb as a primary concept in their work, each of those individuals also discussed how they would modify their language depending on the context and other actors involved. In this way, their discourses of impact (Wróblewska, 2021) were flexible much like their practices. When asked about the reason for this flexibility, one participant shared their belief that the term KMb “is not great, it sounds weird. Nobody knows what it really means, but it’s an invitation to start that conversation about, ‘what does it actually mean to you and to your work?’” (H1). While others echoed this point about KMb—that “it could be a bit more intuitive” (H2)—they nonetheless found it provided “an infrastructure” (E1) for discussing the diverse ways of facilitating KMb. That is, it provided a kind of meta-theoretical language (Ostrom,
2005) for the network: a set of theoretical and practical elements including frameworks, models, strategies, and the relationships between them.

Shifting focus to the institutional level, the main distinction among participants stemmed from the (de)centralization of KMb activities. Fourteen participants believed their respective universities ($N = 11$) adopted a primarily centralized approach to promoting and supporting KMb, characterized by a concentration of expertise in a relatively small set of actors and tendency towards building institutional capacity through top-down efforts. Participants from these institutions described that an advantage of centralization was being able to galvanize action towards organizing events and providing technical services. Centralized roles and departments offered a means for closing “a gap in terms of connectivity between the key players in this realm” (M1). A more centralized model was also believed to put less pressure on individual researchers and organizational units to funnel limited resources toward developing KMb expertise. Responding to a prompt about the utility of centralized services, one participant stated, “why not work with specialized units at the university to help you [with] . . . technical services that make the knowledge mobilization tools we develop more effective” (F1). In this sense, centralization was thought to bolster the likelihood of continuous improvement for KMb activities as evaluation efforts are potentially scaled up. However, participants also expressed concerns that over-centralization might invite more prescriptive activities and inhibit institutional adaptability to dynamic external environments.

At the other end of the spectrum, multiple participants believed that decentralized KMb efforts provided value inasmuch as working with different sectors, fields, and stakeholder groups “changes the nature of the work that you do” (A2). They argued that developing subject-matter KMb expertise could enhance the implementation of highly focused interventions that more
closely align with the strategic directions of different organizational units. Moreover, when prompted to think about the long-term needs for KMb in Canada, one participant commented how decentralization more effectively addressed the issue that “where the culture change has to happen is more on the faculty and academic side” (F1). However, decentralization was not without complications, as one participant highlighted when discussing their experiences at a largely decentralized university:

One of the issues that always comes up is, because so many people are doing this work across the university, it’s hard to know who is doing what, working with who, and making sure that we’re not having overlap, or we’re not asking the same people to do things. The coordination of that is a challenge. (H1)

In a similar vein, another participant described how their institution’s decentralized model meant KMb was “like the clouds: it’s everywhere but it’s nowhere” (K1). Hence, while decentralization was thought to enable widely distributed flows of KMb information and resources among institutional actors and broader stakeholders, participants also saw the potential for vague, confused, or redundant messaging.

Viewed alongside RIC’s ongoing growth, individual and institutional diversity have created a situation of increasing complexity for network learning. Yet, while such complexity might seem to create the potential for network fragmentation, all participants reported a strong commitment to the network.

An Ethos of Impact

_Ethos_, in this use, refers to the characteristic identity of a social collective, and within the shared context of RIC’s member institutions and individual actors, it signifies a “co-created, embedded and positive research impact culture” (Rickards et al., 2020, p. 7). Despite the
diversity of approaches to KMb among participants and their institutions, they were united around this notion of an ethos of impact. In the DE’s first phase (MacGregor & Phipps, 2020), participants tended to describe their work as focused on research administration (including research dissemination and transfer) or brokering and research engagement. While this distinction provided a straightforward taxonomy for participants’ main KMb activities, it disguised the network’s collective focus on promoting impact. In particular, the network finds common ground in that facilitating KMb is technical and relational work (Figure 3.2).

Figure 3.2
An Ethos of Impact for Knowledge Mobilization Professionals

Note. The actions noted in each semicircle are neither exhaustive nor indicative of importance, but rather those that participants most often described during the interviews.

On the technical dimension, facilitating KMb regularly entailed high levels of uncertainty and disagreement about how to achieve desirable outcomes. In describing the complex nature of their work, multiple participants referenced popular KMb and impact competency frameworks (e.g., Bayley et al., 2018; Mallidou et al., 2018). However, they also explained that KMb further
called upon conceptually abstract expertise: “it’s personality, it’s being opportunistic, it’s following your gut, it’s being a good human being” (L1). Each project, or indeed each interaction with researchers and other stakeholders, required a particular combination of traits, competencies, and ethical considerations. And yet, even the more experienced facilitators underscored that successful outcomes were never a guarantee for any particular approach. One experienced participant shared that situational analysis was at least as important for their institution’s KMb services, which “are very specifically tailored for different audiences . . . we always very carefully look at who is the audience and what is the best way to reach them” (F1). Some participants found the requirements of this work oftentimes overwhelming:

Sometimes I don’t have the capacities or the experience, or even the expertise to be of some use. That’s the biggest challenge. I’m like, “Okay, this is out of my . . . I should not be here,” or “there’s something I really don’t understand about knowledge mobilization.”

So, yeah, there’s a real discomfort and I must admit to not fake things. (K1)

Moreover, it was not only the present circumstances that made for complex work; participants also discussed the ever-changing scope of what was valued in KMb. For example, as calls for more evaluation have intensified, participants reported a sense of urgency to develop capacity in “promoting and developing some knowledge mobilization or research impact assessment tools” (B2). They also emphasized the difficulty of working with KMb topics undergoing rapid development (e.g., co-creation), where it was difficult to stay abreast of best practices.

The technical requirements of RIC members’ work also surfaced in how they ride and steer trends for how researchers and stakeholders seek to connect:

For a while, everybody had a blog. Now everybody wants to do a podcast. Now everybody wants to do digital stories. So, what do you mean by that? What are you doing
it for? Now you have a YouTube channel . . . you and 2 billion other people. And sometimes there is a very good reason to have short videos to explain certain things, because you have the perfect audience to engage with those videos. But don’t do something because it looks cool; do it because it’s actually the best way to do it. (F1)

In this way, technical skills alone were not sufficient for facilitating KMb. Participants were adamant about the additional importance of emotional and social capacity in that any activity to increase the relevance or use of research must be chosen with an understanding of why it is likely to generate desirable outcomes within the specific context and with the specific audiences.

Developing expertise as a professional KMb facilitator thus equally hinged on its relational dimension. Even though participants shared that developing relational capacity had until recently taken a subordinate role to technical capacity, this imbalance was righting. As one participant explained when reflecting on changes in the profession in recent years, “we are starting to see the relational aspect of it . . . the interactions between people and people, between institution and institution, between sector and sector” (H2). And more than merely interacting, participants were actively seeding the landscape for KMb as “an approach and a way of engaging in which the partners and parties have equitable power relationships and decision making and really have a shared agenda and move forward together” (J1). Indeed, in the feedback loops that were critical to this work, participants shared how equity in KMb (e.g., grappling with the longstanding issue of service user and community knowledge being treated as subordinate to research; see Ward, 2017) was now a prominent focus for RIC and would compliment its efforts to enrich members’ professional capacity. As a network involving novice through to expert KMb facilitators, different individuals will display different levels of mastery with the technical and
relational actions required in their roles. It is this variance that establishes the value proposition of network learning.

**Tensions on Network learning**

Multiple tensions appeared to influence the internal working of RIC, and similar to the cross-sector collaborations literature (see Bryson et al., 2015), it appeared that a balance in fluctuating tensions created a generative environment for network learning.

**Flexibility and Stability**

Participants expressed that a critical strength of RIC has been its ability to remain dynamic despite an expanding and diversifying membership. Whereas participants shared that some of their other professional groups and networks tended to ossify over time, particularly in response to top-down organizational characteristics, RIC effectively balanced essential structures with emergent needs. One participant commented how they appreciated “the sense of looseness in the network” and went on to suggest that “formalizing things too much would put pressure on some of our member institutions who are smaller and have fewer resources” (F1). Multiple participants similarly expressed their appreciation for the network’s “informal space” (L1) that “helps draw out tacit knowledge and share it” (E1). Network flexibility was thus a strength not only in providing a welcomed shift from past experiences of institutional rigidity in KMb (e.g., a persistent focus on knowledge products), but also in setting up the network to handle exogenous shocks (Bryson et al., 2015), such as those resulting from shifting policy environments for how impact is valued and assessed in Canada.

Simultaneously, participants contemplated whether the ever-expanding network might benefit from additional structures to mitigate endogenous shocks—that is, instabilities in how members interact or find common ground. However, concerns about this possibility were
relatively peripheral, and participants’ proposed solutions centred on improving current learning
opportunities rather than sweeping structural changes. As one interviewee put it,

The first thing we could do . . . is create a more fulsome schedule for folks to meet and
interact. . . . As opposed to trying to dream of something bigger or better, let’s fill up the
existing buckets, and then critically assess how they are working. (H2)

Other participants largely affirmed this perspective, highlighting the idea that gradual
evolution—structural and process changes aligned with the network’s vision while avoiding
alienation or the growth of power dynamics—would bolster rather than deteriorate member
engagement and commitment.

**Openness and Efficiency**

Related to bolstering engagement, RIC was also grappling with the tension of expanding
its parameters of network membership while ensuring efficient operation. As international regard
for the network has grown, so too has an interest in membership among Canadian and
international organizations concerned with KMb. Participants extolled the virtues of a broadened
membership that includes other types of organizations (e.g., non-profits) for increasing the
overall pool of KMb resources and expertise. Speaking from experience in the non-profit sector,
one participant felt “it would allow RIC to be a lot more agile and responsive” (G1) to the needs
of its members’ target audiences. Another described how it might “raise the baseline for people
to actively engage” (H2), implying that a greater number and variety of network members could
stimulate KMb advocacy efforts and more ambitious network activities. On the latter, for
example, some participants suggested that a broadened membership might enable opportunities
such as regional branches or meetings as well as more locally relevant opportunities to “share,
test, and pilot ideas, and to be challenged” (K2). However, an increasingly diverse membership was not viewed without costs. Of note, participants felt that any increased access to resources, material or social, would be moot without the deep engagement needed to harness them. With more varied concerns, interests, and needs, they raised questions about the network’s ability to “go deep into the experience that the other institutions have on certain topics” (B2). In a similar vein, some concerns surfaced about the potentially incompatible operations of non-university members: “commercial partners agenda changes very quickly. So, something which may be a priority for them this year, may suddenly go off the scene altogether next year” (D1). Again, the common sentiment was that gradual evolution would help ensure a balance between a broader membership and network efficiency.

**Unity and Diversification**

A third tension arose between the network’s overarching mission to build the KMb capacity of Canada’s research institutions and respecting the focus areas of individual members. Participants spoke positively about the network’s broad remit, particularly for members whose facilitative functions vacillate between different KMb approaches. For example, when asked what specific topics they would like to see RIC engage with, one participant commented, “I see my role more as involving everything [in KMb] – I need to be aware of everything” (B2). Similarly, other participants described how they would not consider themselves experts in any one archetype of KMb. The resultant inclination towards comprehensiveness in network activities contrasted with the notion of *practice-based subgroups* (PBSs) that emerged earlier in the evaluation (MacGregor & Phipps, 2020).
With PBSs, the idea is that RIC members might organize themselves around specific practice areas (e.g., brokering) to provide enhanced support for the network’s diverse needs. Support for PBSs followed from the view that RIC is “a mixed ecosystem of individuals” (D1), such that “there is value in sharing with the whole network, but that is also part of the challenge because we are all situated slightly differently” (I1). When questioned about the potential benefits of PBSs, participants mentioned the ability to develop “a group of experts” (A1) for specific KMb approaches, increased relevance of network learning activities, and more straightforward points of entry into the network for new members. At the same time, some expressed concerns about the network’s capacity: “for a network that has identified challenges around capacity . . . by creating yet another layer, another mechanism . . . to what extent this will work or provide some value?” (H2). Hence, guarded optimism might best describe RIC members’ thoughts on the prospect of PBSs. While the subgroups may create value, they are not without risk. To be effective, they would need to pull at threads of KMb that excite and engage members without unravelling the network.

Self-Interest and Collective Interest

Finally, building upon the theme of maintaining cohesion, RIC was managing the tension of its networked and institutional governance systems, characterized by coopetition: “the joint and simultaneous occurrence of cooperation and competition across functional areas” (Chiambaretto et al., 2019, p. 584). On the side of self-interest, the network comprises “such different institutions . . . which most of the time are in competition . . . for grants, for visibility, for attention from the government” (K2). Although RIC members expressed commitment to the network’s vision, they were principally committed to their respective organizational and local contexts. This tension was perhaps best illustrated by a participant who stated, “although the RIC
network is probably my most important network . . . if there is something going on in the province that I have to do, I will dedicate time to that before I dedicate time to RIC” (F1). Participants further mentioned how the growing appetite for impact was embroiling their universities in a kind of competition fetish (Naidoo, 2016). Several noted, for example, the international prestige now conferred by performance assessments such as the Times Higher Education Impact Rankings.

Conversely, on the side of collective interest, participants displayed shared awareness that “the work that we’re all doing helps to build the collective expertise around knowledge mobilization, especially in Canada” (H1), signifying a “more of a collective impact approach” (B2). Tying back to RIC’s ethos of impact, the network’s collective orientation was able to mitigate institutional competition in that it is “very much a grassroots organization . . . developing based on people’s interest, and that’s how we’re gaining momentum” (B1). To cultivate this collective orientation, RIC embraces a distributed approach to leadership reliant on various instrumental and expressive relations and structured and unstructured interactions. By inviting but not requiring involvement in the network’s various committees and initiatives, each individual felt their perspectives were valued and professional constraints recognized. For instance, one participant described the network’s decision-making processes as “an open and trusting space . . . [in which] we hear each other, we hear the problems that the others have . . . we realize that we are not alone” (K2). Notwithstanding such favourable views, it was suggested that long-term benefits of the network would require continually revisiting the possibilities of network learning against ever-rising expectations of institutional competition.
**Discussion**

The findings of this paper contribute to the paucity of empirical research on how universities can build capacity in KMb. We focused specifically on understanding the perspectives and experiences of institutionally embedded professionals who facilitate KMb, along with their professional networks that aim to build capacity at scale. This focus is pertinent given that little is known about the work of these individuals in support of universities pursuing societal impacts from research; they are what Watermeyer and Rowe (2021) called “ghosts in the machine” (p. 11). By interrogating RIC’s approach to network learning and co-creating insights about the membership’s acquired expertise, we aimed not only to inform the work of networks with a similar remit, but also the future directions of RIC itself. To that end, we return to the research questions followed by RIC’s management response to the findings.

**Network learning and Facilitating KMb**

Notwithstanding the various admonitions voiced by KMb and impact scholars (e.g., Cain et al., 2018; Chubb & Watermeyer, 2017), impact is “a phenomenon emerging from much broader and longer-term change to HE [higher education]” (Pearce & Evans, 2018, p. 359). Impact is and seemingly will continue to grow as a core aspect of research systems (Budtz Pedersen et al., 2020; Wróblewska, 2021), whether driven by individual agency or collective action (Reed & Fazey, 2021). However, how does the drive for impact become a coherent part of what universities do rather than another function contributing to the *structural accretion* (Fischman et al., 2018) encumbering countless institutions? Should knowledge of how to achieve impact fall to already beleaguered academic faculty? Or should university staff with a history of supporting traditional approaches to KMb (e.g., technology transfer) be conscripted into new areas of work? Such questions, in our view, have no simple answer. Academic faculty and
students play a critical role in KMb (Kokshagina et al., 2021), and university staff in more traditional KMb roles are likely to remain crucial drivers of impact. However, our study lends support to the position that dedicated institutional roles and units are needed to meet the demands of facilitating KMb.

Participants in this study shared how the circumstances of their professional practice varied in terms of their facilitative actions, the discourses of impact at play, and the (de)centralized nature of KMb in their institutional environments. Facilitating KMb called upon specialized technical and relational expertise as well as opportunities for professional learning and a supportive organizational culture. Against the wider backdrop of limited understandings of and institutional readiness for KMb, the complexity of participants’ work necessitated a strong reliance on their professional networks. RIC, through its ethos of impact, has provided networked members with several noteworthy benefits. First, the network helps its members overcome the apparent disconnect between KMb theory and practice:

... the ironic situation that the field of knowledge mobilisation practice seems somewhat detached from its own knowledge base, with knowledge mobilisation activities often being developed and carried out without reference to the existing theory or to practical experience, and without the robust evaluations that could contribute to the knowledge base for the future. (Powell et al., 2017, p. 217)

By sharing and documenting what approaches and activities have worked in different practice contexts and why, participants could draw upon an organizational memory (Belkhodja et al., 2007) far exceeding that available through individual experiences or knowledge of the research literature. Second, with empirical guidance on institutional infrastructure to support KMb still limited, despite some recent examples (e.g., Bayley & Phipps, 2019c; Benneworth et al., 2018;
Cvitanovic et al., 2018), the network enables collective learning about how different institutional structures can impel or impede the drive for impact. Third, the network constitutes a de facto “network of networks” (see D’Agostino & Scala, 2014), in which each member’s personal connections to other KMb practitioners and scholars expand the overall pool of resources. These benefits, while preliminary in understanding the impacts of professional networks like RIC, appear consistent with those observed in discipline-specific areas of KMb (e.g., Brown & Poortman, 2018; Ward et al., 2018).

**Structuring Network learning for KMb**

Regarding the structure of network learning to improve the use of KMb concepts in practice, our insights from this study are more tentative. As Benneworth et al. (2018) note, “higher education institutions are themselves extremely complex organisations” (p. 137), signifying there will be inevitable uncertainty and disagreement within universities about facilitating KMb, let alone among multiple universities in a network. Nonetheless, it seems likely that networks espousing objectives similar to RIC will need to balance four primary tensions if they are to improve universities’ capacity to achieve impact: (a) flexibility and stability, (b) openness and efficiency, (c) unity and diversification, and (d) self-interest and collective interest.

While further research is needed to understand the mechanisms (i.e., the resources and reasoning; see Pawson & Tilley, 1997) through which network learning can best equip KMb professionals for the demands of facilitative work, giving attention to these tensions offers a favourable starting point.

Considering research contexts like Ontario, as well as the growing performance expectations within the higher education sector (e.g., Budtz Pedersen et al., 2012; Hicks, 2012), there is reason to believe researchers and universities may increasingly find themselves between
the blurred lines of assessment-driven and mission-driven systems for achieving impact (see Bayley & Phipps, 2019a, 2019b). The value of network learning in the face of such system change is clear-cut; many structural changes to universities regarding KMb and impact remain uncharted territory, with little empirical research to inform strategic decision-making. In this regard, networks like RIC are critical not only in building the capacities universities need to function effectively in light of the impact agenda, but also in galvanizing action to ensure research policy meets societal needs. However, research systems, like all social systems, “are dynamic and constantly changing” (Best & Holmes, 2010, p. 148), and so embedded networks and their strategic priorities must also evolve.

To that end, Table 3.1 outlines RIC’s management response to the findings of this DE, incorporating the current paper and the results from the first phase (MacGregor & Phipps, 2020). It specifies strategic priorities the network intends to operationalize in the short-term to benefit its membership, with immediate emphasis on the top three priorities. Further research will map how the initiatives associated with these priorities create value for RIC’s member institutions. There is also a need for future research to build upon the findings presented herein about how network learning can enable universities to better tackle local, national, and global challenges.
Table 3.1
Strategic Priorities for the RIC Network to Benefit the Membership

<table>
<thead>
<tr>
<th>Rank</th>
<th># Votes</th>
<th>Priority</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>Forum for senior decision makers</td>
<td>Creating a forum to raise awareness of RIC membership and KMb on member campuses. Currently, senior RIC executives (i.e. VPs Research) are engaged only when new members are approved and when they receive the annual report.</td>
</tr>
<tr>
<td>Tied for 2nd</td>
<td>3</td>
<td>Institutional strategic KMb planning</td>
<td>Developing tools and training to help institutions with strategic planning for KMb and research impact.</td>
</tr>
<tr>
<td>Tied for 2nd</td>
<td>3</td>
<td>Member presentations at monthly meeting</td>
<td>Inviting a different member to present on their institutional KMb practice at each monthly meeting so that members can learn about and from one another.</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>Yaffle for RIC</td>
<td>Adapting Yaffle (<a href="http://www.yaffle.ca">www.yaffle.ca</a>), which provides a database of researcher expertise and research projects, so that RIC members can benefit from improved access to each other and practice-based tools.</td>
</tr>
<tr>
<td>Tied for 4</td>
<td>1</td>
<td>Practice-based subgroups</td>
<td>Creating informal groups of RIC members based on primary role (e.g., grants administration, librarian, research communications, community engagement)</td>
</tr>
<tr>
<td>Tied for 4</td>
<td>1</td>
<td>Grow the profession</td>
<td>Professionalizing KMb by creating standards, training and accreditation.</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>Teaching KMb</td>
<td>Focusing on how to teach the broad skills and functions encompassed by KMb.</td>
</tr>
</tbody>
</table>

Note. Members of RIC’s Evaluation Committee each cast three votes (or abstained) on potential strategic priorities for the network.

Conclusion

There is unmistakable potential for the growing emphasis on impact to genuinely improve how universities and other research organizations interface with society. However, there is also potential for the preoccupations with impact to adversely affect the research enterprise by constricting academic freedom, promoting audit culture, and advancing managerial control (Chubb & Watermeyer, 2017; MacDonald, 2017). Navigating this complex landscape to create healthy impact cultures (Reed & Fazey, 2021) and institutions (Bayley & Phipps, 2019c) will
require skilled and well-connected professionals, and universities would do well to invest in these professionals and their networks.
Chapter 4

Fostering Active Engagement in Knowledge Mobilization:

The Role of Higher Education Institutions

Preamble

Throughout the course of Research Impact Canada’s (RIC) developmental evaluation (DE), two related opportunities arose to contribute to KMb research and practice: (1) the Social Sciences and Humanities Research Council of Canada invited RIC to write a report on the futures of knowledge mobilization as part of the Imagining Canada’s Future initiative, and (2) the *Canadian Journal of Higher Education* (CJHE) released a call for papers on the theme of “Looking Back – Looking Forward,” seeking empirical research that extends current understandings of major shifts affecting Canadian higher education. The former opportunity (now published online; see MacGregor et al., 2021) provided a basis for the latter—the present paper, a version of which was accepted for publication with CJHE\(^7\), pending minor revisions. The paper draws on the findings from Phase I and Phase II of Research Impact Canada’s developmental evaluation, which are supplemented with practitioner narratives to identify key recommendations for institutional KMb professionals (practice contribution) and questions for the field of KMb going forward (empirical contributions). I led the design of this research as well as the data collection and analysis procedures. I co-wrote the paper with the Dr. David Phipps (Network Director, Research Impact Canada; Assistant Vice President, Research Strategy and Impact, York University), and three experienced members of RIC: Cathy Malcolm Edwards

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Facilitator, Carleton University), Jen Kyffin (Community Liaison, University of Victoria), Virginie Portes (Director of Grants and Communication, Université de Montréal). To respect the language of CJHE’s call for papers, we use “higher education institutions” in this paper.

**Introduction**

Research can play a critical role in addressing local and global challenges, yet too often it goes underutilized (Boaz et al., 2019; Nutley et al., 2007). In Canada and abroad, governments and research funders are responding to this issue by increasing expectations that research is accompanied by knowledge mobilization (KMb) efforts to achieve impact beyond the academy (Cain et al., 2018; McLean et al., 2018). Research impact (hereafter, impact) refers to “the influence scholarly and creative inquiry has upon wider society, intended as well as unintended, immediate as well as protracted” (Federation for the Humanities and Social Sciences, 2017, p. 13), and KMb refers to the intentional efforts to achieve impact. Despite the increasing pressure, researchers and higher education institutions (HEIs) are struggling to build their capacity in KMb (Cooper et al., 2018; Fischman et al., 2018; Sá et al., 2011, 2012). Recent studies suggests that institutionally embedded professional staff who operationalize KMb efforts may have a critical role to play in improving the current situation (e.g., Cvitanovic et al., 2017; van der Graaf et al., 2019; Wye et al., 2019). However, very little is known about this emerging area of professional practice.

To date, much of the scholarly literature in KMb has focused either on (a) the public policies driving increased emphasis on impact (e.g., Bandola-Gill, 2019; Boswell & Smith, 2017; Williams & Grant, 2018), or (b) moving research evidence into use by a downstream stakeholder and assessing that use (e.g., Edwards & Meagher, 2020; Budtz Pedersen et al., 2020). The roles and activities of HEIs and embedded KMb professionals remain comparatively understudied,
particularly how KMb can be jointly driven by individuals and institutions. This gap is salient considering that HEIs are the link between what governments and funders want and what researchers and their partners can deliver. Hence, in this paper, we present findings from a developmental evaluation of Research Impact Canada’s (RIC) efforts to build institutional capacity for KMb at scale. In particular, following a look back at key developments surrounding KMb, we interrogate how the lessons learned from the institutionally embedded KMb professionals of RIC provide insight into likely future developments for HEIs. From there, we offer suggestions grounded in recent literature and informed by practitioner expertise about how funders, institutions, and researchers could position themselves in this future.

Review of the Literature

We begin with a brief review of past and present KMb developments in Canada and, to a lesser degree, globally. Considering the many areas of study that intersect with KMb (e.g., implementation science, research utilization), our review is necessarily partial, focusing on major developments that inform the forward-looking direction of this paper.

Where Have We Been?

University research has always had the potential to generate societal impacts. In Canada, health researchers have had close to 25 years of funding to support the advancement of impact, beginning in 1996 with the Canadian Foundation for Healthcare Improvement’s (n.d.) explicit mandate to build the Canadian health system’s capacity for knowledge transfer and exchange. In the time since, the three federal research funding agencies—collectively, the Tri-Agency—have each enhanced their efforts to improve connections among research production, mediation, and use contexts (Holmes & Strauss, 2019). The Canadian Institutes of Health Research (CIHR), founded in 2000, takes up this work through its legislated mandate in both creating and
translating knowledge for the improved health of Canadians. The Social Sciences and Humanities Research Council of Canada (SSHRC) launched a renewed program architecture in 2006 that required every grant application to include a KMb strategy (i.e., a plan outlining anticipated impacts with the target audiences along with the efforts that will be made to achieve them; see SSHRC, 2019). The Natural Sciences and Engineering Research Council of Canada has increasingly emphasized the concept of innovation and commercialization to ensure funded research is of service to Canadians. More recently, in late 2018, the Tri-Agency launched the New Frontiers in Research Fund, which will invest in programs of research designed to achieve impacts in defined social, economic, environmental, or health challenges (Government of Canada, 2021).

An increasing emphasis on impact is not only a Canadian phenomenon. Studies illustrate international and growing attention to how research can support effective responses to current and future global challenges (e.g., Doyle, 2018; Wilkinson, 2019). However, unlike impact contexts such as the UK and Australia, Canadian researchers and HEIs have been, in most cases, incentivized to develop ex-ante descriptions of how research will lead to impact rather than post hoc descriptions of what impacts were achieved through past research. This distinction is viewed as a difference between mission-driven and assessment-driven systems for impact, respectively (Bayley & Phipps, 2019a), and it provides a basis from which to consider the modern impact landscape.

Where Are We Now?

The dual expansion of mission-driven and assessment-driven systems constitutes the so-called “impact agenda”: a proliferation in approaches for mobilizing, assessing, and communicating how research can achieve societal value (e.g., see Budtz Pedersen et al., 2020;
Greenhalgh et al., 2016; Hill, 2016). Much disputed in the HEI landscape (Bandola-Gill, 2019), the impact agenda implicates both individuals and institutions in realizing the societal benefits of research.

**Implicating the Individual**

Frameworks, models, and specialized languages abound for how individuals and groups participate in KMb, complicating the field for scholars and practitioners of impact alike (Powell et al., 2017, 2018). At a general level, Best and Holmes (2010) offer a “three generations” perspective for conceptualizing different approaches to KMb. Campbell et al. (2017) summarize it as follows:

- **Linear models** in which research is produced and then made available for users in a mainly one-way relationship;
- **Relationship models** (such as network and partnership models) that build on linear models but focus on enhancing relationships between and among researchers and practitioners to facilitate the development and mobilisation of research and practice connections;
- **Systems models** that move away from linear processes and involve a more complex process involving interaction, co-creation and implementation of evidence throughout all levels of a system, plus identifying and addressing barriers to mobilising research and practice knowledge for evidence use.” (p. 212)

The generations framing reflects an overall trend in the field of KMb towards addressing the limitations of earlier rational-linear approaches (Budtz Pedersen et al., 2020) and involving more diverse stakeholders and forms of knowledge (e.g., co-produced knowledge; Jull et al., 2018). However, within HEIs, where myriad KMb efforts are underway at any given time, it remains
likely that examples of all three models are operating concurrently, with linear models reflecting traditional tech transfer or commercialization efforts, relationship models reflecting public engagement efforts, and systems models reflecting network building and co-production. The need to grapple with such complexity has prompted the development of various ways of conceiving the competencies individuals, especially professional staff, need to effectively navigate impact pathways (e.g., Bayley et al., 2018; Mallidou et al., 2018; Straus et al., 2011). Yet, to date, there are few empirical studies of how various expressions of these competencies take shape for different approaches to KMb or how they may relate to the effectiveness and impact of different approaches (MacKillop et al., 2020; Neal et al., 2021).

Further complicating the impact landscape for individuals, multiple studies have found that KMb remains a peripheral concern for many Canadian researchers (Cooper, 2017; Cooper et al., 2018; Fischman et al., 2018) and without robust institutional backing (Cain et al., 2018; Cooper, 2015; Sá et al., 2011). Individuals regularly find limited time for interactive KMb efforts, insufficient access to institutional resources, unrealistic expectations and work overload, scarce opportunities for professional support and development, and precarious working conditions for professional impact staff (e.g., Knight & Lyall, 2013; van der Graaf et al., 2019; Wye et al., 2019). There is a resultant need for further inquiry into how different actors holding different KMb roles within HEIs can work synergistically, overcome constraints, and build collective efficacy.

**Implicating the Institution**

The impact agenda has also precipitated various opportunities and challenges for universities’ organizational structures and processes. To characterize the circumstances, Fischman et al. (2018) invoke the concept of *structural accretion*, suggesting that new KMb and
impact functions are being introduced “without either foregoing old ones or creating separate new institutional structures to support these functions. . . generat[ing] disruptive demands on well-established traditions and university operations, challenging each institution to reengineer itself to survive” (p. 2). Institutional adaptation in this regard is hampered by the limited empirical research that considers how HEIs might serve as intermediaries in advancing impact; indeed, as Pearce and Evans (2018) observe, “impact as a concept is largely absent from studies discussing long term changes to HE [higher education] and university structures” (p. 351).

Returning to the example of KMb and impact competencies, multiple studies have noted that organizations are largely overlooked in the research literature compared to the individual (e.g., Bayley & Phipps, 2019b; MacKillop et al., 2020; Mallidou et al., 2018).

Notwithstanding the nascent literature base, Canadian universities display marked interest in building capacity to support impact. For instance, the U15 is a signatory on several Global Network statements that consider the role of HEIs in (inter)national development. One of the most well-known is the Hefei Statement, which asserts that “it is critical that all relevant policies [acting within or upon institutions] recognize the broad, pervasive and long-term benefits of university research and education and provide the support and environment that will ensure that these institutions continue to flourish” (“Hefei Statement,” 2013, p. 3). In other words, the statement holds that HEIs play a key role in addressing local and global challenges, but it also acknowledges that policies espousing short-term or instrumentalist views about what makes HEIs effective constrain that role. Similarly, the Leiden Statement, while focusing on social sciences and humanities disciplines, describes the essential role of research in helping “us

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8 The U15 is a group of 15 research-intensive Canadian universities, and the Global Network is an international group of networks of research-intensive universities (see http://u15.ca/international).
understand what it means to be human in a complex world that is dynamic and multi-dimensional” (“Leiden Statement,” 2014, p. 3). Collectively, such documents establish the overarching vision that universities are crucibles of societal change in Canada, generating influence through high-quality research, teaching, and KMb. Advancing this vision requires a pragmatic way of linking the historical context of HEIs with the individual and institutional dimensions of impact. To that end, we employ the concept of *impact literacy*.

**Conceptual Framework: Impact Literacy**

Impact literacy is defined as an ability to “identify appropriate impact goals and indicators, critically appraise and optimise impact pathways, and reflect on the skills needed to tailor approaches across contexts” (Bayley & Phipps, 2019a). It encompasses three elements that characterize impact pathways:

- **How**: the intentional and emergent practices that create impact (i.e. KMb),
- **What**: the measurement and articulation of manifest impacts, and
- **Who**: the human force that facilitates the integration of how and what.

Bayley and Phipps (2019b) later added the fourth element *why* to prompt a baseline understanding of the motivations for pursuing impact and the concomitant ethical considerations (e.g., power dynamics, potential negative impacts). As with the impact agenda, impact literacy upholds that “impact is only achievable (and sustainable) if operationalised into individual *and* institutional practice” (Bayley & Phipps, 2019a). Indeed, Figure 4.1 illustrates that institutional and individual impact literacy are interdependent and symbiotic, and a discrepancy between the individual and institutional levels can constrain their collective ability to generate impact.
Table 4.1 describes how the different levels of impact literacy can be generally characterized for institutions and individuals, depending on their respective capacity to critique and integrate the available evidence about impact and KMb practices. Bayley and Phipps (2019b) are careful to emphasize that these levels are intended to provide a conceptualization of developmental progression, not any blunt categorization of impact literate versus non-literate. In this way, some individuals and institutions may lie between these general levels. For example, an institution could be classified as “enabling” based on its policies, plans, or strategies for KMb and impact, but “supportive” in that it has not yet invested in developing individuals’ capacities. Similarly, an individual could be classified as “engaged” based on how they comprehend the evidence base for impact and KMb, but “aware” if their efforts remain primarily direct at the level of individual projects.
Table 4.1
Levels of Institutional and Individual Impact Literacy

<table>
<thead>
<tr>
<th>Institutional Impact Literacy</th>
<th>Individual Impact Literacy</th>
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<tbody>
<tr>
<td><strong>Supportive</strong>: basic conditions, wherein the expectations for generating impact are largely imposed on researchers with limited or lacking institutional policies, plans, or strategy for KMb or impact.</td>
<td><strong>Aware</strong>: basic level of comprehension, which signifies an understanding that an emerging evidence base for impact and KMb exists, but there is uncertainty about how to incorporate it into professional practice. Efforts are directed primarily at the level of individual projects.</td>
</tr>
<tr>
<td><strong>Enabling</strong>: intermediate conditions, wherein a more active and reflexive approach to generating impact is taking shape, including policies, plans, or strategy for KMb and impact. There are also some efforts to support embedded individuals in developing their individual impact literacy.</td>
<td><strong>Engaged</strong>: intermediate level of comprehension, which signifies being informed by and engaging with the evidence base for impact and KMb. Efforts are directed at both the project and programme level.</td>
</tr>
<tr>
<td><strong>Driving</strong>: advanced conditions, wherein the approach to generating impact goes beyond external requirements and where institutional policies, plans, and strategies for KMb and impact support both embedded individuals and external stakeholders. There are also substantive efforts to build individual impact literacy and continuously improve current efforts.</td>
<td><strong>Critical</strong>: advanced level of comprehension, which signifies the capacity to not only engage with the evidence base for impact and KMb, but also synthesize, critique, and extend the available evidence. Efforts are increasingly directed at a systems level.</td>
</tr>
</tbody>
</table>

*Note.* See Bayley and Phipps (2019b) for a cross tabulation of the different levels of institutional and individual impact literacy.

For our purposes, impact literacy provides a model for conceptualizing how HEIs, through the agency of professional staff, can foster active engagement in KMb. Unlike other frameworks and models that consider KMb practices within single initiatives, impact literacy enables a broad understanding of the KMb landscape that centers the development of impact-healthy institutions (see Bayley & Phipps, 2019c).
Methods

Data for this study were drawn from a developmental evaluation of RIC’s efforts to build institutional capacity for KMb. Developmental evaluation holds stakeholder engagement and co-creation as essential principles for effecting change in complex adaptive systems (Patton, 2011). In contrast to traditional approaches to evaluation, it requires that evaluators become embedded in change processes: they “ask questions, use data to reflect the system at a given time, ask stakeholders what they think might explain the patterns, and brainstorm collective solutions or avenues to improved processes or impacts” (MacGregor & Cooper, in press). Accordingly, all data collection and analysis procedures were jointly driven by the external evaluator (lead author), who joined RIC as part of their Evaluation Committee, and other senior individuals from RIC (particularly the other authors of this paper).

Evaluation Context

Founded in 2006 through a SSHRC/CIHR Intellectual Property Mobilization grant, RIC has grown from a two-university collaboration into a pan-Canadian network of HEIs, spanning all provinces except Prince Edward Island. While RIC’s member institutions display considerable diversity in their local and organizational contexts (e.g., different values and norms for KMb), they are united by the network’s mission: “creating value from knowledge by developing and sharing best practices, services and tools, and by demonstrating to relevant stakeholders and the public the positive impacts of mobilizing knowledge” (RIC, 2018, p. 2). To join the network, prospective institutions must demonstrate (a) documented commitment to institutional KMb and impact, (b) established investment in KMb supports, and (c) a desire to share their expertise in a network learning environment.
It is noteworthy that despite a modest operating budget, RIC ranks among the top research brokering organizations in Canada (Cooper, 2014), and it contrasts more common short-term KMb initiatives with its sustained efforts to advance how HEIs facilitate KMb (Phipps et al., 2015). Moreover, unlike networks that focus on a specific discipline or subject (e.g., PREVNet, a network that seeks to create impacts from research on bullying), RIC’s remit spans disciplines and sectors. As RIC’s work has garnered (inter)national regard, the network has rapidly grown. Since this phase of the evaluation began in late 2019, the network has grown from 17 to 21 HEIs, which include eight of the U15 universities (i.e., a collective of Canada’s most research-intensive universities) as well as the University of Brighton (UK) as an international member.

**Data Collection**

The findings presented herein build upon an earlier phase of RIC’s developmental evaluation that employed survey methods to investigate its networked approach to building institutional KMb capacity (MacGregor & Phipps, 2020). Following that phase, semi-structured interviews were conducted with participants from 15 of the 21 member institutions between December 2019 and April 2020. It should be noted that data collection occurred during the initial months of the COVID-19 pandemic, and as such all interviews were conducted using the Zoom videoconferencing software. Participants were “internal members” as described in the RIC logic model (i.e., network contributors, Governance Committee members, and institutional executive leads; Bergen, 2018), with the following professional characteristics:

- All were professional staff, with nine having KMb in their job titles (e.g., Manager of KMb) and the others having aspects of research communications, strategy, partnerships, exchange, or engagement;
• All but one worked under the leadership of a vice-president, research (or equivalent role);
• 17 stated KMb was the main concept used in their work, while the others used knowledge exchange, knowledge translation and transfer, or research impact; and
• They possessed medians of 2.8 years in their institutional role and 2.0 years with RIC.

All interviews lasted 60–90 minutes and followed a semi-structured protocol to ensure collected data were comprehensive and systematic, to anticipate and address logical gaps in the data, and to interrogate participants’ local HEI contexts (Patton, 2002). The interview guide (Table 4.2) was developed in consultation with the RIC Evaluation Committee and featured questions that explored participants’ practices as members of the network and as individual KMb professionals embedded in HEIs.

Table 4.2
Major Dimensions of the Semi-Structured Interview Protocol with Example Questions

<table>
<thead>
<tr>
<th>Major Dimension</th>
<th>Example Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional environment for KMb</td>
<td>1. What factors are driving your institution’s approach to KMb?</td>
</tr>
<tr>
<td></td>
<td>2. Does your institution have future plans for KMb that vary from current practice?</td>
</tr>
<tr>
<td>Perspectives on network learning</td>
<td>3. What kinds of information would improve the usefulness of RIC’s activities to build institutional KMb capacity?</td>
</tr>
<tr>
<td></td>
<td>4. How can RIC enhance contact and learning between members?</td>
</tr>
<tr>
<td>Primary job functions and effective practices</td>
<td>5. What are your main work activities?</td>
</tr>
<tr>
<td></td>
<td>6. What models, theories, or frameworks do you use in your KMb work?</td>
</tr>
<tr>
<td>Perspectives on the future of KMb in Canada</td>
<td>7. In your conversations with other KMb professionals in Canada, what questions about KMb seem to come up repeatedly?</td>
</tr>
<tr>
<td></td>
<td>8. What aspects of KMb do people in your institution seem most animated about?</td>
</tr>
</tbody>
</table>
Data Analysis

All interviews were audio recorded, transcribed, and shared with participants for member checking. Transcripts were then uploaded into NVivo 12 and thematically analyzed using the constant comparative method (Glaser & Strauss, 1967). Initial coding was undertaken by the lead author and another KMb researcher. Each analyst read and re-read the interview transcripts and engaged in a process of “breaking down, examining, comparing, conceptualizing, and categorizing data” (Strauss & Corbin, 1990, p. 61). After independently coding one quarter of the interview data, emergent categories and sub-categories were compared, differences in data interpretation and coding were discussed, and a general coding scheme was developed (DeCuir-Gunby et al., 2011). The lead author then met with the RIC Network Director to discuss the coding scheme and early insights from the analysis. Following several clarifications (e.g., disaggregating participants’ recommendations for the network versus for other members), the lead author then analyzed the full data set. When the codebook could not be applied to represent key meanings in the transcripts, new codes were added and analysis continued.

As the analysis progressed, several feedback loops were set up with different RIC audiences (e.g., Governance Committee, Steering Committee, broader membership) in the form of “ongoing sense-making activities: interpreting, synthesizing, and generating insights and recommendations using multiple forms of written and verbal communications” (Preskill & Beer, 2012, p. 8). These feedback loops (see Chapter 1) ensured the timely sharing of findings and thus facilitated informed decision-making about how RIC could adapt to its dynamic internal and external contexts.

In keeping with the principles of DE, the findings presented below were co-created. Specifically, we combine a traditional presentation of descriptive qualitative findings with
narrative representations from several KMb practitioners of RIC. The narrative representations were developed after sharing early versions of the descriptive qualitative findings. Combining the two forms supported the crystallization of findings, enabling “a deepened, complex, thoroughly partial, understanding of the topic” (Richardson, 2000, p. 934) through “contrasting approaches to analysis and representation, while also being self-referential to their partiality” (Ellingson, 2011, p. 10). That is, the two forms of representation aimed to provide practice-relevant insights while interrogating research-based concepts. Additionally, by applying our conceptual framework, we supplement each section with questions for institutions and embedded KMb professionals intended to prompt the development of more advanced levels of impact literacy.

Findings

With our focus on the role of HEIs in the future of KMb, we organize our findings into two sections: (a) recommendations from RIC members about how KMb professionals can thrive in their institutional environments, and (b) questions they believe the higher education sector needs to give particular consideration in the years ahead. Participants are distinguished in the illustrative quotations using a letter assigned to institutions at random and a number assigned to members from the same institution at random (e.g., A2).

Recommendations for How KMb Professionals can Thrive in Institutional Environments

Cultivate a Systems Perspective

The first recommendation offered by participants was to cultivate an awareness for the socio-cultural contexts of KMb, with emphasis on an institution’s local contexts. A systems perspective recognizes KMb “processes and relationships themselves are shaped, embedded and organised through structures that mediate the types of interactions that occur among multiple
agents with unique worldviews, priorities, languages, means of communication and expectations” (Best & Holmes, 2010, p. 148). RIC members make this perspective tangible by (a) embracing the complexity of KMb within their institution and (b) being intentional about learning their local contexts. Regarding the former, one participant commented how their successful experiences with KMb were predicated on “being open to trying things and keeping track of what works, what doesn’t... and the [associated] context” (F1). This participant went on to describe how, over time, some approaches to KMb that once produced positive outcomes had waned in utility as the institutional context evolved (e.g., as researchers’ familiarity with KMb improved). This point was salient when considering the networked context of RIC, as members were aware that the outcomes of any KMb activities were “going to be different depending on everyone’s context” (H1), meaning that a “what works” approach to KMb would falter without understanding why specific activities worked given various contextual factors.

At the same time, cultivating a general awareness of Canadian and international contexts for KMb was secondary to an in-depth understanding of local contexts for producing and using knowledge. Two participants described how they generated momentum in their work by reaching out to many different research stakeholders on and off campus to learn “how important knowledge mobilization was for them, the facilitators and barriers they saw in their work, how much of it they do, and also what the university could do to help” (B2). This initial work enabled the triaging of KMb activities to meet institutional needs under limited resources, while appreciating that long-term support for KMb would require showing early return-on-investment. However, sustaining momentum was another story. As a more experienced participant commented, “I’m two years in, and it still takes a lot of time to reach out, find out what is happening across campus, and build those relationships. And it’s an ongoing process that you
continually have to pay attention to” (A3). Our first practitioner narrative further elucidates these findings.

**David Phipps, York University**

Universities are systems of multiple faculties and they sit within external systems. RIC members learn from each other, but we do not copy each other because our on and off campus systems are different. By way of a few examples, York University is a suburban university with close ties to a region with a high newcomer population, the University of Regina has a strong relationship with Indigenous communities, the Memorial University of Newfoundland has a unique one university/one province culture, and UQAM is located in the inner city of Montreal.

To successfully practice KMb, I can get tools, tips, and techniques from RIC members, but I need to invest my time and energy adapting those to my local context based on my experience as a KMb practitioner at Mobilize University since 2006. In my experience, I am successful working in the Mobilize Region system because I connect to people to understand their context. I have key contacts in the United Way, Regional Municipality of Mobilize, and Mobilize Region District School Board, among others. I also have key contacts across campus in faculties and in central service units. Fostering these contacts is a necessary pre-condition to working in a systems perspective. I cannot sit in my office and push out what I think is important, I need to meet them where “they” are and find out what “their” needs are. Working that way connects me to my KMb system.

**Questions for Institutions:**

- Who are the key stakeholders on- and off-campus involved in institutional KMb efforts?
What institutional structures and processes could be created, evolved, or annulled to better utilize embedded KMb capacity? For instance, how could renewal, tenure, and promotion processes better recognize KMb efforts?

Questions for KMb Professionals:

- What intentional efforts do you take to build an understanding of your institution’s local contexts for KMb? Who could you connect with on- and off-campus to expand your current understandings of this context?
- How are you cultivating your awareness and understanding of the evidence base for KMb and impact? What are your processes for integrating new understandings into your local institutional efforts?

Invest in Professional Capital

The second recommendation was for KMb professionals to invest in their professional capital, a confluence of human, social, and decisional capital (Hargreaves & Fullan, 2012). Human capital engages with the notion that frontline KMb professionals need specific competencies for effective practice. In the view of RIC members, human capital extended beyond core knowledge and skills: “it’s personality, it’s being opportunistic, it’s following your gut, it’s being a good human being” (L1). Supporting one another’s professional development thus required more than sharing content and procedural knowledge; it also required attentiveness to areas such as personal disposition (see Jessani et al., 2016, for more on this topic).

Along the line network learning, social capital respects that effective KMb is founded upon interactions and relationships. As one participant put it, “I’m not sure if I could identify just one physical resource [from RIC], but the human resources, that’s my value proposition” (H2). Another member explained that “we hear each other, we hear the problems that the others have,
and then we realize that we are not alone . . . that they have the same problems in some cases as we do” (K2). It is noteworthy that nearly every participant underscored the value of their relationships within the RIC network for advancing their practice. More than the content of exchanges, trusting connections with other members enabled the shared investigation of why particular KMb approaches did or did not achieve expected results.

The third element, decision capital, deals with how KMb professionals learn to make informed judgements about effective KMb throughout the course of their career. Early career professionals often struggle to make rapid decisions about the best course of action for a given problem of practice. As KMb professionals, RIC members described the importance of developing the ability to make judgements in situations with incomplete evidence and uncertain solutions: “You’re doing physics one day and you’re doing history of art one day, so you really have to be very versatile in your ability to think and share and develop some kind of education around knowledge mobilization itself” (C1). However, developing that ability was no simple undertaking, and in this respect, participants extolled how the RIC network provided opportunities to observe more advanced decisional capital built up “through structured and unstructured experience, practice, and reflection” (Hargreaves & Fullan, 2012, p. 114). Our second practitioner narrative expands on the development of professional capital.

**Virginie Portes, Université du Montréal**

The choice to develop expertise in KMb within the Office of Research at Université du Montréal was prompted by the growing importance given to this aspect by Canadian granting agencies. In recent years, professors have been required to include a KMb plan in most of their grant applications. Given the advisory function of a research office, how can we help professors reflect on and structure this section of their application and convince them of its merits? At
Université du Montréal, we recruited a KMb advisor with a specific mandate that had not yet been included in the more traditional range of research support services offered in the Office. This advisor took the few KMb training courses available, provided his colleagues with KMb tools, gave workshops to raise awareness on the specific issues of the KMb, managed KMb competitions, while establishing the necessary links with internal and external stakeholders. In terms of professional development, the opportunity offered by the RIC network has been crucial in continuing to evolve the advisor’s role, notably by integrating him into a network of practitioners offering tools, guides, advice, and numerous opportunities to learn and share. The position requires flexibility and openness, as well as a range of competencies (e.g., communication, facilitating and liaising, advocating change, networking, coaching, digital literacy). It is therefore an unusual, transdisciplinary, and absolutely necessary expertise that has been developed within a research office.

**Questions for Institutions:**

- What institutional resources are allocated to support professional learning in the areas of KMb and impact for embedded KMb professionals?
- How are KMb professionals valued within the institution (e.g., promotion, recognition, transparent career pathways)?

**Questions for KMb Professionals:**

- What intentional efforts do you undertake in your professional learning to build your KMb competencies and social connections?
- What are your short-term and long-term goals for building your individual impact literacy and contributing to your institution’s impact literacy?
Questions for HEIs in the Future of KMb

What Does Effective KMb Look Like?

More than any other topic, RIC members wanted to hear about what others in their network had learned from doing KMb. Reflecting on the growing number of frameworks and general tools for KMb, one member commented,

It’s fun to have these tools . . . but if we had a sense as to what the barriers were, what the facilitators were, what the evaluation or the outcomes of their efforts were, and what validation has been done, it would be even more useful. (B2)

This sentiment was echoed across institutions, suggesting that in tandem with the professionalization of KMb, members of RIC are increasingly requiring evidence about the actions and consequences of different approaches to KMb. Participants felt that network learning opportunities like RIC were critical not only to share “resources and evidence to inform best practices” (A2) and “amplify knowledge mobilization” (A3) on their campuses, but also to further the evaluation of KMb activities. Without the higher education sector continuing to place emphasis on advancing the science of KMb through theory-informed evaluations (e.g., making use of realism and its focus on context-mechanism-outcome configurations; see Davies et al., 2015), RIC members believed it would be difficult to gain wider institutional support for KMb.

Our third practitioner narrative underscores the gravity of mobilizing lessons learned from doing KMb.

Cathy Malcolm Edwards, Carleton University

The term “evidence-based” is part of our everyday vernacular, and at the same time, it is quite loaded. As knowledge mobilizers, we are asked to supply proof something will work, show the value of an investment of resources, or give advice to mitigate risk. In a field that is
seemingly equal parts knowledge and intuition, a blending of the art of becoming with the science of understanding, success is not as simple as counting numbers (people, events, connections, publications, etc.). I often find myself struggling to provide evidence of the inherent value of the process of KMb. How do you demonstrate growth, influence, and impact or evaluate meaning and connection? These are big questions that extend far beyond the world of KMb but for those of us with a professional network like RIC, we have a place where we can talk about them.

Shared learning is essential in a mobilizer’s world. Just as RIC was focused on impact long before it was the “in” term, it also has been an early adopter of the failure report. Over the last few years, as part of our annual general meeting, we have created space for members to share what has been tried that fell flat, was a misstep, or perhaps even an epic fail. This is not driven by morbid curiosity but an intention of understanding so we can do better. In a field that relies on understanding and embracing the human condition, it is as important to share our “even better if’’ moments as well as our wins. The field of KMb is new and will continue to grow and evolve. Keeping a steady static state is not enough when called to a place of service for researchers, students, and their research partners.

Questions for Institutions:

- What evaluation methods and processes are in place to document and subsequently act upon the outcomes of KMb efforts?

- How is the institution engaging with and contributing to the evidence base for KMb?

Questions for KMb Professionals:

- What opportunities to learn from and with other KMb professionals are you involved in?
How could you support your professional networks in advancing evidence-informed approaches to professional learning?

**How Can KMb Be Taught Effectively?**

Building upon the desire to improve KMb practices by learning from one another, RIC members wanted to know how to effectively teach KMb. Multiple participants explained that a significant proportion of their work with faculty and graduate students deals with the basics of KMb (e.g., terminology, frameworks, models). And although capacity-building opportunities are growing across the country (e.g., the knowledge translation training programs offered by the Hospital for Sick Children, the Certificate in Knowledge Mobilization offered by the University of Guelph, and the MobilizeU course offered by York University), many of those are either intended for a professional audience, are not yet a common offering across universities, have access limitations for some audiences (e.g., high costs for graduate students), or are not well-suited to addressing the questions and issues of a more immediate nature. Moreover, the few extant examples of university curricula related to KMb in the literature (e.g., Jessani et al., 2019) have limited evidence around effective course delivery. Without robust teaching tools, RIC members had witnessed how structured and focused network learning about facilitating KMb could become washed down at the point of practice, where “it’s a lot of meetings—too many meetings and not enough time to do things” (I1). Commenting on this issue, one participant explained that “we just really struggle with is packaging all of this information, because there’s such a diversity of what knowledge mobilization is—the spectrum is so wide” (L1). At once, the RIC network provided a window into the diversity of approaches to KMb, but packaging and communicating that diversity in ways that met research stakeholders’ learning needs and interests was an enduring challenge.
On the other hand, several participants stressed how RIC’s network learning provides an avenue through which to develop improved curriculum and pedagogy for KMb in Canada: “RIC has informed . . . the ways in which I try to teach knowledge mobilization to others, the ways in which I define knowledge mobilization, the resources that I give others” (A3). Looking ahead, several members of the RIC Professional Development committee spoke with enthusiasm about the network’s ongoing efforts to develop a shared KMb curriculum to enhance positive learning outcomes within Canadian HEIs. Our final practitioner narrative illustrates how one RIC member institution is leading the charge in teaching KMb practices.

**Jen Kyffin, University of Victoria**

At the University of Victoria, teaching KMb practices to students, faculty, and community partners is an important approach for building individual and institutional capacity for research impact. Working together with researchers and community stakeholders, the Research Partnerships and Knowledge Mobilization unit co-develops and delivers training on foundational KMb topics, including planning and dissemination tools, communication strategies, evaluation, and ethical considerations in the co-production of knowledge. Theme-based workshops target the development of specific skills (e.g., KMb plans, info visuals) through presentations, hands-on learning activities, and facilitated discussions in which participants share their diverse expertise.

Embedding foundational components into undergraduate and graduate curriculum is another way that we teach KMb. Several of our research methodology courses now include knowledge translation activities (e.g., plain language writing assignments), and in one multidisciplinary research course—a collaboration with a provincial ministry—students, with guidance from their instructor and ministry staff, undertake research projects that directly
addresses policy and service delivery needs. Students share their research findings with decision-makers and practitioners through presentations, videos, research summaries, infographics, roundtable discussions, and other forms of KMb.

These modes of teaching KMb work well within our local context, and along with the practices and experiences of our network colleagues at other Canadian HEIs, are informing the development of a shared KMb curriculum.

Questions for Institutions:

• What opportunities exist within the institution for researchers and external stakeholders to learn about and practice KMb?

• How could KMb learning opportunities (e.g., building trusting relationships with external stakeholders, develop KMb competencies) be made a central part of research training?

Questions for KMb Professionals:

• What pedagogical principles and approaches do you employ when facilitating researchers and external stakeholders learning about KMb?

• How could institutional efforts to facilitate learning about KMb complement the growing course offerings? (see Jessani et al., 2019)

Discussion

As we highlighted at the outset of this paper, there remains a general paucity of empirical research on institutionally embedded KMb professionals. These individuals occupy a unique position within HEIs as drivers of KMb, and as such, they are well-positioned to inform how institutions might improve current efforts. To that end, our findings offer a critical contribution to KMb research and practice by engaging with the perspectives of frontline professionals embedded within RIC’s member institutions. Based on their recommendations and questions for
the field, as well as past and present developments, we now propose two areas in which HEIs could foster the future of KMb in Canada. Additionally, given our focus on both the individual and institutional dimensions of KMb via the impact literacy framework, we offer recommendations aligned with these two areas for HEIs, embedded individuals (professional staff as well as researchers and students), and governments and research funders (Table 4.3). The impetus for including this latter group stems from their position of power in setting the expectations for national research systems, as well as the need for context-sensitive guidance regarding potential KMb directives.
### General Areas and Recommendations for Fostering the Future of KMb

<table>
<thead>
<tr>
<th>Areas for Future Development</th>
<th>Individuals</th>
<th>HEIs</th>
<th>Governments and Research Funders</th>
</tr>
</thead>
</table>
| 1. Valuing KMb and impact as core components of research systems | **Professional Staff:**  
- Cultivate awareness and understanding of the evidence base for KMb; integrate new understandings into local institutional context  
- Build your professional competencies  
- Advocate for your professional networks to contribute to the evidence base for KMb  
- Explore how to enhance institutional learning opportunities for KMb  

**Researchers and Students:**  
- Advocate for an expanded perspective on standards of excellence that account for KMb efforts  
| - Advocate for KMb as an important dimension of research training and RTP  
- Examine institutional structures and processes for supporting and promoting KMb (e.g., working with Senate and faculty unions to develop best-practice guidelines for faculty to use during renewal, tenure, and promotion review)  
- Make use of evidence-informed tools to assess individual and institutional impact literacy  
- Develop processes for integrating new understandings and practices for KMb  

| - Identify key stakeholders involved in institutional KMb efforts  
- Hire and support the professional learning of KMb professionals  
- Establish and promote programs for connecting researchers with local, national, and international partners  
| - Require that research institutions support researchers in developing and implementing KMb strategies in grant applications, akin to what is done for the NSERC I2I program  
- At the funder level, train merit reviewers to review KMb plans  
- Establish a funding program to support the development of KMb capacity across Canada, akin to the NSERC IPM program that ended in 2009, with the expectation that funding responsibility will eventually be transferred to HEIs |
| 2. Facilitating (inter)national connections for KMb practice and scholarship | **Professional Staff:**  
- Develop an understanding of local contexts and stakeholders for KMb efforts  
- Examine involvement in professional learning opportunities for KMb (e.g., networks, groups)  
- Examine pedagogical principles and approaches for facilitating learning opportunities about KMb  

**Researchers and Students:**  
- Make use of the available KMb supports within institutions  
- Advocate for the hiring and professional learning of KMb professionals  
- Value KMb in grant applications on similar footing as research plans, respecting that KMb is the “how” of achieving impact  
| - Identify key stakeholders involved in institutional KMb efforts  
- Hire and support the professional learning of KMb professionals  
- Establish and promote programs for connecting researchers with local, national, and international partners  

| - Require that research institutions support researchers in developing and implementing KMb strategies in grant applications, akin to what is done for the NSERC I2I program  
- At the funder level, train merit reviewers to review KMb plans  
- Establish a funding program to support the development of KMb capacity across Canada, akin to the NSERC IPM program that ended in 2009, with the expectation that funding responsibility will eventually be transferred to HEIs |
Valuing KMb and Impact as Core Components of Research Systems

In view of Canadian and international trends, there is evidence to suggest that KMb and impact will become increasingly integrated as core components of research systems. Considering the Canadian context, beyond strategizing for KMb in research funding applications, the New Frontiers in Research Fund is designed to create lasting changes for scholarship and society (Government of Canada, 2021). Targeted challenges may be fundamental, leading to a scientific breakthrough, or applied, with potential social, economic, environmental, or health impacts. However, in either case, applications will not require a separate impact strategy; instead, descriptions of KMb efforts are at the core of the research proposal. This integration with the research process illustrates a maturing role of KMb in grant applications and mirrors McLean et al.’s (2018) finding that KMb “is a high and still growing priority” (McLean et al., 2018) for governments and research funders (see also Holmes et al., 2012; McLean & Graham, 2014; Tetroe et al., 2008).

In step with this mission-driven focus, there appears to be growing interest in assessing impact. In Ontario, for instance, new performance-based funding agreements were recently introduced that will raise the current 1.4% in operating funding tied to HEI performance to 60% by 2025 (Ministry of Colleges and Universities, 2021). Under these agreements, four of the 10 metrics are intended to capture economic and community impact (e.g., community/local impact of student population). Although these Strategic Mandate Agreements permit publicly funded HEIs to negotiate the weighting of metrics to reflect institutional strengths and roles, the agreements nonetheless represent a drift towards assessment-driven research policy. Hence, it seems likely that Canada will see an ongoing blurring of the boundaries between assessment-driven and mission-driven systems of impact (Bayley & Phipps, 2019b; Budtz Pedersen et al.,
2020), where governments and funders will incentivize impact and institutions will drive impact through KMb efforts. A highly skilled workforce of KMb professionals will be essential to ensuring that Canadian HEIs are well-positioned in this future.

Relatedly, as KMb and impact become core components of research systems, they will need to be recognized in renewal, tenure, and promotion (RTP). The local contexts of RTP review are critical to understanding, recognizing, and rewarding scholarship that reaches beyond academia (Lambert-Pennington, 2016), yet RTP policies in Canadian HEIs are inconsistent regarding KMb efforts (Barreno et al., 2013). As HEIs increasingly value KMb as a means to contribute to local and global challenges (e.g., as set out in the Hefei Statement [2013] and Leiden Statement [2014]), RTP policies and their implementation at the departmental, faculty, and senate levels will need to evolve to recognize and reward such activities.

**Facilitating (Inter)national Connections for KMb Practice and Scholarship**

As illustrated in by the international authorship of texts such as *What Works Now?* (30 authors from eight countries; Boaz et al., 2019), scholars around the world are generating insights about KMb. However, according to Powell et al. (2017, 2018), those insights have limited uptake with practitioners, signaling a rift between KMb research and practice. This longstanding irony of KMb follows, in part, from researchers not working on the problems that practitioners face. This situation drives the lack of evidence use by practitioners. To overcome this hurdle, there is a need for more research-practice collaborations that reach beyond international boundaries. This is perhaps best exemplified in the ongoing collaboration between Drs. David Phipps and Julie Bayley, who have been collaborating on the topics of KMb and impact literacy since 2016 (Bayley & Phipps, 2019a, 2019b, 2019c). Their co-created KMb scholarship and practitioner resources have sparked interest and widening collaborations in
Canada, UK, US, Demark, Belgium, Iran, Australia, and New Zealand. They also co-chair a Research Impact and Stakeholder Engagement Working Group under the auspices of the International Network of Research Management Societies, which includes members from Canada, UK, US, Australia, New Zealand, Ghana, and Japan. Increasingly, such individual collaborations are also being replicated at the national level. RIC, for instance, is collaborating with the US-based Advancing Research Impact for Society network. Together they developed an impact and stakeholder engagement tool kit for the aforementioned working group and delivered a cross-border impact conference in April 2021. However, in order to thrive, these collaborations hinge on supportive, impact literate HEIs that can acknowledge and activate individuals’ impact literacy.

**Conclusion**

As HEIs become increasingly embedded in the impact agenda and attuned to the societal and competitive advantages offered through KMb, the need to build HEIs capacity in KMb will intensify. KMb is not merely a Canadian phenomenon; whether in a mission-driven or assessment-driven system, impact is on the radar of many governments and research funders around the world. HEIs in Canada can foster the future of KMb by building organizational and individual impact literacy and by creating more opportunities to learn about KMb.
Chapter 5

An Overview of Quantitative Instruments and Measures for Impact in Co-Production

Preamble

This final paper of this dissertation developed in response to an enduring problem of practice identified for the KMb professionals who participated in Chapters 2-4. Specifically, the participants were found to be struggling with how to support researchers and their external partners in measuring the impacts of co-production. This paper aimed to (a) simplify what has become a difficult topic to parse for KMb practitioners (practice contribution), and (b) inform the future development of measurement tools with strong psychometric and pragmatic qualities (empirical and methodological contributions). I independently led all aspects of this research, which first appeared in the *Journal of Professional Capital and Community* in early 2021. It should be noted that the opportunity to publish this research coincided with a call for papers on mobilizing knowledge in professional learning networks, a model of professional learning developed by Drs. Chris Brown and Cindy Poortman that is similar to the research models that some members of Research Impact Canada support. For this reason, the language of “professional learning networks” was used throughout the paper.

Introduction

Professional learning networks (PLNs)—groups “who engage in collaborative learning with others outside of their everyday community of practice” (Brown & Poortman, 2018, p.

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— are emerging as an effective way to impact education systems through mobilizing diverse types of knowledge. However, measuring the specific impacts of PLNs using quantitative approaches remains a major challenge. *Impacts*, in this use, refer to the downstream changes resulting from PLN activities and outputs, which can be instrumental or conceptual, intended or unintended, and immediate or protracted (Federation for the Humanities and Social Sciences, 2017). Recent developments in PLN-related topics, such as research-practice partnerships, have shown that measuring impact is especially challenging under the complex conditions of co-production, wherein multiple stakeholders “aim to shift the research paradigm from one in which the researcher is the sole expert to one in which researchers and stakeholders co-lead research activities and collectively apply their expertise, knowledge and skills within a team” (Hoekstra et al., 2020, p. 2). A scoping review by Cooper et al. (2021), for example, found that despite the publication of at least 80 articles on the topic of research-practice partnerships since 2007, only three have provided any guidance about measuring impact. Without robust guidance, stakeholders such as those in PLNs have little recourse to draw comparisons across contexts, to support informed decision making for increasing the effectiveness and sustainability of interactions, or to provide evidence for the impacts of mobilizing knowledge among diverse stakeholders (Davies et al., 2015; Durose et al., 2018; Hoekstra et al., 2020).

The purpose of this paper is to make a first step in addressing the quantitative measurement gap for co-production and PLNs by exploring findings from related fields of study.

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10 *Impact* is often used interchangeably with *outcomes* (Hoekstra et al., 2020). As the distinction is rarely clear-cut in research assessment scholarship, some scholars have taken to the lexical use of “impact” as encompassing both outcomes and impacts (e.g., Edwards and Meagher, 2020). This general meaning of impact is applied here.

11 Other terms are often used in place of co-production (Oliver et al., 2019), particularly co-creation. A recent systematic review of co-production and co-creation with citizens in public innovation showed “that empirically co-creation and co-production are used as interchangeable concepts” (Voorberg et al., 2015, p. 1340). Here that finding is respected, meaning that while co-production is the term used throughout, no distinction from co-creation is made.
Specifically, this paper explores the quantitative measurement of impacts in fields of study with theoretical similarities to co-production, such as participatory research or engaged scholarship (e.g., Nguyen et al., 2020). Given the volume of primary evidence in these fields, this paper presents an overview (Hunt et al., 2018) that integrates the evidence from multiple reviews designed with the express purpose of identifying instruments and measures with strong psychometric and pragmatic qualities. The following research question and sub-questions were investigated:

- What quantitative measurement tools (instruments and measures) have been used to measure impact in fields of study related to co-production?
  1. In what contexts have these measurement tools been used?
  2. What are the main constructs and content themes of the measurement tools?
  3. To what extent do the measurement tools display strong psychometric and pragmatic qualities?

Before moving forward, it is important to note the key contribution of this overview over and above the reviews on which it is based. First, it provides a broader picture of the measurement landscape for co-production than available in any one review, which is useful considering the rapid growth in interest and study in this topic. Second, by aggregating the insights and recommendations from various reviews, this overview provides stakeholders involved in co-production with more readily available guidance to inform their decision making. Finally, this overview provides a springboard for developing quantitative instruments and measures for the impacts of co-production that have strong psychometric and pragmatic qualities.
**Literature Review**

This section begins with a brief review of the literature that depicts how co-production can be understood within the scope of mobilizing knowledge. It then moves on to the topic of measuring impact, describing current perspectives on impact in co-production followed by how the psychometric and pragmatic qualities of instruments were understood in this review.

**Mobilizing Knowledge**

Different types of knowledge, or ways of knowing, correspond to different ways of collecting, analyzing, and synthesizing data about the social world (e.g., see Dewey, 1933). Whereas *empirical knowing* is linked to formal and systematic methods of inquiry, *theoretical knowing* and *experiential knowing* are linked to intuitive, informal, and practical methods (Nutley et al., 2007). Distinctions between these types of knowledge are rarely clear-cut, and thus questions such as “what counts as research” continue to be explored in various contexts. However, Nutley et al. (2007) observe that research tends to be associated with empirical and theoretical types of knowledge. Conceptualizing knowledge in this way not only offers a useful heuristic but also enables seeing research as existing in “an ecology of knowledge, where [it] must compete with other ways of knowing for influence” (Davies et al., 2015, p. 36).

“Mobilizing” knowledge signifies an active and intentional process for turning knowledge into action. One of the most comprehensive frameworks for how this process takes shape comes from Davies et al.’s (2015) cross-sector mapping of health, social care, and education. They base their framework on a synthesis of 71 published reviews on the topic, website review of the activities of 186 research agencies, interviews and a follow-up survey with individuals from those agencies, and two stakeholder workshops to share emerging insights. Altogether, their results led to the development of eight archetypes (A through H) for mobilizing
knowledge: (A) producing knowledge, (B & C) brokering and intermediation (own research or wider research), (D) advocating evidence, (E & F) researching practice (research into practice or research in practice), (G) fostering networks (building on existing networks and developing new ones), and (H) advancing this field of study. In contrast with more general frameworks (e.g., the framing of linear, relationships, and systems models of mobilizing knowledge), which can be nevertheless valid, the archetypes framework is useful for pinpointing areas for further development in scholarship and practice. The area of focus in the present study is co-production, which draws together archetypes F and G (Beckett et al., 2018)—note, archetype E is not included, despite its grouping with archetype F, as it deals with knowledge produced externally to the stakeholders involved in change efforts (see Davies et al., 2015).

Co-Producing Research

The theory and praxis of co-production is an area of study with several distinct traditions and numerous related fields of collaborative research (e.g., integrated knowledge exchange, engaged scholarship, mode 2 research, participatory research; Nguyen et al., 2020). Moreover, co-production exists against a backdrop of “‘cobiquity’ – an apparent appetite for participatory research practice and increased emphasis on partnership working, in combination with the related emergence of a plethora of ‘co’ words, promoting a conflation of meanings and practices from different collaborative traditions” (Williams et al., 2020, p. 2). With such a diversified origin and an expanding popular usage, any “one-size-fits all” approach to defining co-production is neither appropriate nor feasible. Hence, similar to Beckett et al. (2018), it is useful to view the theoretical aspects of co-production with reference to Davies et al.’s (2015) archetypes for mobilizing knowledge:
• **Archetype F**: “highlights local learning and absorptive capacity development, as well as locally produced, often co-produced, research knowledge”;

• **Archetype G**: “the socially situated way in which research contributes to knowledge, is melded with existing tacit knowledge, is moulded by an understanding of local preoccupations and contingencies, and is actioned in complex and ‘political’ environment.” (Davies et al., 2015, p. 117)

With these archetypes in mind, co-production entails, in theory, that all research stakeholders (researchers, service users, public contributors, professionals; Williams et al., 2020) have an active role in knowledge formulation, production, and extension. In practice, however, empirical study has shown that the potential of equal partnering for bringing about social change can conflict with reality that co-production is “much harder to do well than more traditional ‘push’ and ‘pull’ approaches and require[s] considerable commitment and stamina alongside sufficient resources” (Powell et al., 2018, p. 44). Addressing this challenge requires attending to the paucity of empirical evidence about the processes and impacts of co-production (Oliver et al., 2019). Focusing in on the impact dimension, a first step is a critical exploration of how to measure impact using tools with strong psychometric and pragmatic qualities.

**Measuring the Impacts of Co-Production**

In a related review, Hoekstra et al. (2020) found that research partnerships, which take co-production as an overarching principle, can realize impacts on (a) researchers conducting partnership research, (b) stakeholders involved in research partnerships, (c) the relationships between researchers and stakeholders, (d) the relevant community or society, and (e) the research process. They go on to note, however, that “studies evaluating research partnership approaches are scarce and mainly focus on perceived and self-reported outcomes/impacts” (Hoekstra et al.,
There is consequently a need not only to develop more robust instruments and measures for the impacts of co-production, but also to document the various measurement tools that may be adapted from related constructs.

Measuring\(^\text{12}\) how research (in co-production or otherwise) achieves impact is complicated insofar that pathways to impact are often “uncertain, iterative, contingent, and highly social” (Davies & Nutley, 2008, p. 6) as well as political and value-laden (Greenhalgh et al., 2016). While there is emerging consensus that mixed methods approaches to measuring impact can assuage some of these challenges by minimizing the limitations of quantitative and qualitative methods applied independently (e.g., Budtz Pedersen et al., 2020), there is also recognition that current quantitative approaches are failing to capture impact in co-production in ways that are meaningful, consistent, rigorous, reproducible, and equitable (Durose et al., 2018). Specifically, an overreliance on narrowly construed impact measures in the form of simple metrics and indicators means that many research stakeholders are “‘count[ing] what can be easily measured’, rather than measuring what ‘counts’ in terms of significant, enduring changes” (Milat et al., 2015, p. 1). Even in cases where more connections are made to measurement theory or to the theoretical dimensions of co-production, those connections are rarely borne out in attention to the psychometric and pragmatic qualities that ultimately underpin the use and continual refinement of measurement tools in practice (Stanick et al., 2021).

Psychometric qualities concern the degree to which a measurement tool measures what it intends to measure and whether the resulting interpretations support its proposed uses (i.e., validity) in addition to the degree to which it is consistent (i.e., reliability). The Standards for

\(^{12}\) Although “assessing” and “evidencing” are common terms in the research impact literature, this review uses “measuring” in respect of this review’s quantitative focus.
Educational and Psychological Testing (*the Standards*; AERA, APA, and NCME, 2014) outline five sources of validity evidence: content, response processes, internal structure, relationship to other variables, and consequences. While a detailed description of these is beyond the scope of this article, it is noteworthy that other sources of evidence are commonly invoked based on different conceptualizations of validity (e.g., see Clifton, 2020). There are similarly various sources of reliability evidence, but three of the most common ask whether results are consistent over time (test-retest reliability), across items (internal consistency), or between different observers (inter-/intra-rater reliability). Pragmatic qualities, on the other hand, concern the features of a measurement tool that make it practical for stakeholders to use (Glasgow & Riley, 2013), including whether it is *acceptable* (e.g., offers a relative advantage over existing methods), *compatible* (e.g., fits organizational activities), *useful* (e.g., informs decision making), and *easy to use* (e.g., uses accessible language; Stanick et al., 2021). Beyond these measurement qualities, it is also important to differentiate between instruments and measures, as reviews vary in this focus. Whereas an instrument refers to a complete measurement tool, a measure refers to a specific part of an instrument (Sandoval et al., 2012). Hence, an instrument often includes multiple measures. For example, the National Center for Research in Policy and Practice (2016) developed an instrument for measuring practitioners’ use of research that contains measures about practitioners “participation in research activities” and their “attitudes towards research.”

**Methods**

The overarching aim of this review was to identify and synthesize relevant literature reviews concerning the quantitative measurement of impacts arising from co-production. With an eye to the diverse literatures that share theoretical similarities to co-production, this aim was advanced by conducting an overview (also called an umbrella review; Paré et al., 2015) of
instrument reviews. Overviews are a recent development in response to the increasing number of systematic reviews published in all fields of research, offering one approach for “bringing together reviews in a transparent and systematic way and aiding informed decision making by gathering, appraising and systematically analysing this evidence” (Hunt et al., 2018, p. 2). While there are obvious limitations to bringing together methodological tools designed for the measurement of different constructs or intended for use in different contexts, this overview engages with that limitation in order to expand perspectives on measuring impact in co-production. Conduct of the review was guided, where possible, by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (i.e., the PRISMA guidelines; Moher et al., 2009).

Identifying Relevant Articles

A two-step search strategy developed in consultation with a research librarian was used to identify relevant articles by entering keyword strings (Table 5.1) into electronic databases covering the social sciences and humanities, natural sciences, and health sectors: Academic Search Complete, Business Source Premier, CINAHL, ERIC, Education Source, Medline, ProQuest, PsycNET, Scopus, Sociological Abstracts, and Web of Science. The first set of searches focused on content sharing a theoretical link with co-production and its impacts or measurement, without prespecifying that the record be a review article. The second set adapted the first by (a) including constructs either less common or with a more peripheral link to co-production, and (b) specifying that the record be a review article. Combined, these searches enabled the identification of core and subsidiary literatures. Both searches focused on identifying key concepts in record titles to prevent a dramatic increase in off-target content (e.g., for Academic Search Complete alone, title searches returned 310 hits, whereas title or abstract searches returned 6,321 hits). Search limits included language (English only), publication type
(peer-reviewed academic journal articles), and publication date (up to March 2020). The first set of searches identified 2,159 records, and the second identified 96 records.

Table 5.1
**Keyword Synonyms for Systematic Searches of Electronic Databases**

<table>
<thead>
<tr>
<th>Search</th>
<th>Co-Production Terms</th>
<th>Measurement Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Co-production</td>
<td>Asses</td>
</tr>
<tr>
<td></td>
<td>Co-creation</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td>Co-design</td>
<td>Measurement</td>
</tr>
<tr>
<td>Integed knowledge translation</td>
<td>Impact</td>
<td>Indicator</td>
</tr>
<tr>
<td>Engaged scholarship</td>
<td>AND</td>
<td>Metric</td>
</tr>
<tr>
<td>Research partnerships</td>
<td>OR</td>
<td>Scale</td>
</tr>
<tr>
<td>Collaborative research</td>
<td>OR</td>
<td>Survey</td>
</tr>
<tr>
<td>Participatory research</td>
<td></td>
<td>Questionnaire</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instrument</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Additional search terms</th>
<th>Systematic Review Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Mode 2</td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td>Linkage and exchange</td>
<td>Systematic review</td>
</tr>
<tr>
<td></td>
<td>Knowledge to action</td>
<td>Scoping review</td>
</tr>
<tr>
<td></td>
<td>Knowledge translation</td>
<td>Narrative review</td>
</tr>
<tr>
<td></td>
<td>Knowledge transfer</td>
<td>Meta-analysis</td>
</tr>
<tr>
<td></td>
<td>Knowledge exchange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implementation science</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research utilization</td>
<td></td>
</tr>
</tbody>
</table>

*Note. Boolean search functions were used whenever supported by the database (e.g., measur* to account for all possible suffixes).*

**Article Selection**

All articles considered for inclusion were uploaded into Endnote X9.3.3 for removal of duplicates and records corresponding to books and book sections, before subsequent upload into the online systematic review platform Covidence. Three general criteria were used to screen article titles and abstracts for inclusion in the full-text review:

- Research was one of the knowledge types considered in co-production;
- The article was a literature review, such as a systematic or scoping review; and
• The quantitative measurement of impacts was explicitly or implicitly mentioned.

In total, 121 articles met these criteria. Before conducting the full-text review, each article’s reference list was scanned for relevant literature missed in the search procedure. This reference harvesting strategy identified 56 potentially relevant articles that were subsequently screened against the above inclusion criteria, leading to an additional 20 articles included for full-text review. All 141 full-text articles were then screened against the following exclusion criteria:

• A focus on formula-based indicators of impact rather than latent constructs (e.g., number of best business practices adopted per year);

• Explicit mention that the article does not focus on measuring impacts;

• Examination of primary studies about impacts but not in terms of measurement tools;

• Researchers were the sole stakeholders considered;

• Co-production impacts were shown to be related to included measurement constructs but not directly as a feature of the instrument or measure; and

• Substantive reproduction and refinement by a more recent review (e.g., Squires et al., 2011, which expanded upon Estabrooks et al., 2003).

As shown in Figure 5.1, eight reviews were considered eligible for inclusion in this overview. Four of the included reviews (Buchanan et al., 2015; Lewis et al., 2015; Lawlor et al., 2019; Squires et al., 2011) were initially considered marginally relevant given their apparent focus on one-way transfers of research knowledge. However, these reviews were ultimately included in recognition of the varying levels of stakeholder engagement in collaborative approaches to research such as PLNs (Hoekstra et al., 2020), which may cycle through more co-productive and exchange-type interactions (Cherney, 2015).
Data Extraction

Analysis of the included reviews followed a systematic method of using a data extraction framework to synthesize and interpret salient findings. The framework included general characteristics of the included reviews and all stated information about the measurement tools related to the research questions. The psychometric qualities of instruments and measures was recorded with reference to the sources of evidence noted above. Consistent with reporting recommendations for overviews (Hunt et al., 2018), the analysis aimed to provide an accessible
summary of review findings and to synthesize review findings “in order to bring new insights to existing evidence” (p. 6). However, comparisons of the methodological quality of reviews was not an objective in this overview; strict comparisons were not plausible, as no criteria were employed for the type of review included. This analytic approach positioned the review to map how fields of study related to co-production are measuring impact (where it is difficult to visualize the nature, extent, and range of research activity). A necessary delimitation to note when interpreting the findings is that two reviews (Granner & Sharpe, 2004; Squires et al., 2011) targeted measures rather than instruments, and another review considered both (Sandoval et al., 2012). As a result, the figures reported for these reviews are greater than would be the case if instruments were the focus.

Findings

Contexts of Use

As shown in Table 5.2, included reviews were published between 2004 and 2019, with seven published since 2015. In contrast, of the primary studies represented in the reviews, only 17.2% were published since 2010. Seven reviews were focused primarily on the health sector and one on the education sector, though the instruments and measures within each review were applied in various geographic contexts and with diverse target populations. Based on the five reviews that reported a country of origin for the measurement tools, the majority were developed in North America (38% in the US, 22% in Canada), the UK and Europe (30%), or Australia (6%). Based on the same five reviews, 92% of the measurement tools relied on participant self-report, with the remaining 8% including tools such as scorecards and checklists, collectively classified as Other. In total, the eight reviews described 441 instruments and measures designed
to capture aspects of mobilizing knowledge among diverse research stakeholders, with 291 (66%) exhibiting relevance for measuring impact.

Table 5.2
*General Characteristics of the Included Reviews*

<table>
<thead>
<tr>
<th>Sector</th>
<th>No. of Instruments and/or Measures*</th>
<th>No. of Primary Studies (since 2010)</th>
<th>Geographic Context</th>
<th>Primary Target Population(s)</th>
<th>Response Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boivin et al. (2018) Health</td>
<td>27 instruments, 15 with an outcome focus</td>
<td>27(19)</td>
<td>UK (10), Canada (8), US (7), Greece (1), Australia (1)</td>
<td>Patients, members of the public</td>
<td>Self-report (15), Other (12)</td>
</tr>
<tr>
<td>Buchanan et al. (2016) Health</td>
<td>34* instruments</td>
<td>35(8)</td>
<td>UK (14), US (8), Australia (5), Canada (3), Sweden (2), Ireland (1), the Netherlands (1), New Zealand (1), Puerto Rico (1), Taiwan (1)</td>
<td>Occupational therapists, occupational therapy students</td>
<td>Self-report (34)</td>
</tr>
<tr>
<td>Granner &amp; Sharpe (2004) Health</td>
<td>146 measures, 20 with an outcome focus</td>
<td>26(0)</td>
<td>Not reported</td>
<td>Members of community coalitions</td>
<td>Not reported</td>
</tr>
<tr>
<td>Lawlor et al. (2019) Education</td>
<td>18* instruments</td>
<td>18(12)</td>
<td>US (11), Canada (2), England (2), Scotland (1), Wales (1), Germany (1), Israel (1), not reported (2)</td>
<td>Administrators, teachers, school staff members</td>
<td>Self-report (18)</td>
</tr>
<tr>
<td>Lewis et al. (2015) Health</td>
<td>104* instruments</td>
<td>88(23)</td>
<td>Not reported</td>
<td>Implementation stakeholders</td>
<td>Not reported</td>
</tr>
<tr>
<td>Sandoval et al. (2012) Health</td>
<td>46 instruments, comprising 34 measures with an outcome focus</td>
<td>46(0)</td>
<td>Not reported</td>
<td>Community-based participatory researchers and practitioners</td>
<td>Not reported</td>
</tr>
<tr>
<td>Squires et al. (2011) Health</td>
<td>60* measures</td>
<td>108(0)</td>
<td>US (43), Canada (22), Europe (22), Australia (5), Africa (2), Taiwan (2), Iran (1)</td>
<td>Healthcare providers, healthcare decision makers, healthcare organizations</td>
<td>Self-report (60)</td>
</tr>
</tbody>
</table>

*Note.* *denotes a review for which all measures or instruments displayed, to varying degrees, an outcome focus. Bracketed numbers indicate the quantity in the corresponding sub-category.
Main Constructs and Content Themes

Each review employed a different construct (Table 5.3) and espoused varying degrees of engagement from different research stakeholders throughout the research process, as well as varying degrees of alignment with the theoretical aspects of co-production. Specifically, characteristics of the definitions suggested that involvement from different stakeholders should be meaningful; active; allow for ebb and flow in their involvement at all stages of the research process; require the pooling of abilities, expertise, and resources; balance research and action; lead to justifiable resolutions to community-centered problems; and ultimately seek to effect change. Comparing the content themes of the measurement tools to Hoekstra et al.’s (2020) categories for the impacts of research partnerships approaches, reviews most frequently captured impacts at the stakeholder level \( (n = 8) \), followed by the relevant community or society \( (n = 6) \), relationships between researchers and stakeholders \( (n = 3) \), and then researchers \( (n = 2) \) and the research process \( (n = 2) \). An unexpected observation was the lack of reviews using co-production as the main construct (or closely related constructs, such as co-creation or integrated knowledge translation), despite the zeitgeist surrounding these terms in recent scholarship and practice.

Table 5.3
Constructs and Content Themes Examined

<table>
<thead>
<tr>
<th>Main Construct and Definition/Description (direct quotation)</th>
<th>Link Between Construct and Content Themes</th>
<th>Content Themes of Identified Measurement Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boivin et al. (2018) <strong>Patient and public engagement:</strong> “a meaningful and active collaboration in the governance, priority setting, and conduct of research, as well as in knowledge translation”</td>
<td>Deductive – literature on evaluating public engagement in healthcare policies and programs</td>
<td>Three content themes, but no explicit definitions: -Context -Process -Perceived self-reported impact</td>
</tr>
<tr>
<td>Buchanan et al. (2016) <strong>Evidence-based practice (EBP) learner outcomes:</strong> “three domains within the learner (affective, cognitive and”</td>
<td>Deductive – literature on evaluation in evidence-based healthcare</td>
<td><strong>Knowledge:</strong> “the acquisition of awareness or facts, data, information, ideas or principles to which one has access through formal or individual study, research, observation, experience or intuition” (Wojtczak, 2002, p 451, as cited on p. 60)</td>
</tr>
<tr>
<td>Authors</td>
<td>Description</td>
<td>Methodology</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Granner &amp; Sharpe (2004)</td>
<td>Coalitions and community partnerships: “a means of pooling the abilities, expertise and resources of numerous stakeholders to positively affect community health” (p. 514)</td>
<td>Deductive – literature on factors of coalition functioning identified in the literature</td>
</tr>
<tr>
<td>Hamzeh et al. (2019)</td>
<td>Organizational participatory research (OPR): “a blend of research and action that follows several steps in a cyclical manner: (a) identifying the problem, acting, i.e., planning and implementing a proposed intervention(s); (b) assessing the proposed intervention(s); (c) acting again, i.e., planning and implementing an improved intervention(s) using assessment results, etc.” (p. 116)</td>
<td>Inductive – developed a new model (the Organizational Participatory Research Evaluation Model) to organize the content</td>
</tr>
</tbody>
</table>

**-Attitudes:** “views, perceptions, beliefs and intentions relating to EBP” (p. 60)

**-Skills:** “performing EBP steps in some type of clinical scenario” (p. 60)

**-Behaviours:** “actual performance of EBP in practice” (Shaneyfelt et al., 2008, p 1117, as cited on p. 60)

**-Member Characteristics and Perceptions:** representation, skills and experience, participation, role clarity, sense of ownership, sense of community, expectations, perceived effectiveness, satisfaction, commitment, participation benefits, participation costs

**-Organizational or Group Characteristics:** leadership, staff performance, formal organizational structure, task focus/meeting effectiveness

**-Organizational or Group Processes and Climate:** stages of coalition development, community capacity, organizational climate, commitment, group relationships, communication, conflict, decision making, recruitment, action plan quality, implementation, resources

**-General Coalition Function or Scales Bridging Multiple Constructs:** member characteristics, organizational climate, collaboration, general functioning

**-Impacts and Outcomes:** community linkages, impacts, organizational viability, institutionalization, capacity/empowerment

**-Trust:** supportive environment, shared power, strategic alignment of group with organization

**-Collective learning:** new knowledge, new attitudes, new practices, problem solving, personal concerns

**-Sustainability:** commitment, partnership cohesion, effective resource allocation, synergy
<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Methodology</th>
<th>Content Themes</th>
</tr>
</thead>
</table>
| Lawlor et al.   | Use of research evidence (URE): “the incorporation of research evidence to make decisions, think about problems and potential solutions, and justify the resolution of problems” (p. 218) | Inductive – post-hoc link drawn to Vivian Tseng's (2012) conceptual framework of URE | Three content themes, each with specific measurement dimensions: 
- **User characteristics**: perceptions and attitudes related to research evidence; capacity for using research; confidence locating, evaluating, or using research
- **Environmental characteristics**: information sources, effective structures for URE, and school culture and research promotion
- **Implementation and practices**: current use of research evidence or evidence-based/informed practices at the individual level

| Lewis et al.    | Implementation outcomes [description more than definition]: “perhaps the most critical factor in implementation science as they define what we seek to explain in research and what we seek to improve in practice” (p. 2) | Deductive – Enola Proctor and colleagues’ work on implementation outcomes | Seven content themes corresponding to the seven implementation outcomes defined by Enola Proctor and colleagues (see Lewis et al., 2015) 
- **Acceptability**
- **Adoption**
- **Appropriateness**
- **Cost**
- **Feasibility**
- **Penetration**
- **Sustainability**

| Sandoval et al. | Community-based participatory research (CBPR): “an approach to develop culturally centered interventions and collaborative research processes in which communities are directly involved in the construction and implementation of these interventions and in other application of findings” (p. 680) | Deductive – Nina Wallerstein and colleagues’ model for CBPR | - **Context**: community capacity, health issues, historical context of collaboration, national/local policies and political governance, organizational capacity
- **Group Dynamics**: relational, structural, individual
- **Outcomes**: empowerment and community capacity, change in practice or policy, unintended consequences, health outcomes

| Squires et al.  | Research utilization [definition not explicitly stated] | Deductive – literature on measuring research utilization, with reference to the Standards | Instruments categorized according to the strength of validity evidence, not content themes. |

**Note.** “Content Dimensions” data includes all dimensions represented in the measurement tools, not exclusively those with an outcome or impact focus.

**Psychometric and Pragmatic Qualities**

Table 5.4 presents a summary of the psychometric and pragmatic evidence for the 291 instruments and measures exhibiting relevance for measuring impact. Across measurement constructs and contexts, the reviews reported that primary studies generally provided limited...
psychometric evidence: only 45% of instruments and measures were supplemented with any form of validity evidence and only 35% with any form of reliability evidence. That said, how the reviews recorded psychometric evidence showed marked variation: Whereas two reviews conceptualized validity and reliability as described in The Standards (Lawlor et al., 2019; Squires et al., 2011), others drew on the popular COSMIN checklist for evaluating the methodological quality of studies on measurement properties (Hamzeh et al., 2018; Buchanan et al., 2016), developed brief and focused evidence-based assessment criteria specifically for the review (Lewis et al., 2015), relayed evidence directly as it was reported in the primary studies (Granner and Sharpe, 2004; Sandoval et al., 2012), or captured general rather than specific information about sources of evidence (Boivin et al., 2018). Aside from validity evidence based on internal structure, which only applies to multi-item instruments and measures, the most common sources of validity evidence provided by the primary studies were content (40%), relations to other variables (39%), and response processes (17%). All “Other” sources of validity evidence recorded by the reviews (cross-cultural, face, and a coarse version of construct validity) accounted for 5% of the total evidence. Of the primary studies that reported on reliability, 94% did so as internal consistency as represented by Cronbach’s alpha, 7% as inter/intra-rater reliability, 3% as test-retest, and 1% as “Other” (e.g., based on previous factor analyses).

Three reviews (Boivin et al., 2018; Hamzeh et al., 2019; Lewis et al., 2015) provided other sources of psychometric evidence labeled separately from validity or reliability. These additional sources of evidence identified measurement tools that were (a) informed by a review of the relevant literature (n = 1), (b) based on stakeholder expertise (n = 12), (c) grounded in a theoretical or conceptual framework (n = 9), (d) clear about the origin of component items (n =
4), or (e) supplemented with information on response norms (n = 75) and information about responsiveness (n = 4).
<table>
<thead>
<tr>
<th>Tools*</th>
<th>No. of Tools</th>
<th>Validity</th>
<th>Psychometric Evidence</th>
<th>Reliability</th>
<th>Other</th>
<th>Pragmatic Evidence (concepts used by authors)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Disaggregated by Sources of Evidence</td>
<td>Total</td>
<td>Disaggregated by Sources of Evidence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boivin et al. (2018)</td>
<td>15</td>
<td>8</td>
<td>Not specified</td>
<td>2</td>
<td>Not specified</td>
<td>1 informed by a literature review, 12 based on stakeholder expertise, 9 grounded in a theoretical or conceptual framework</td>
</tr>
<tr>
<td>Buchanan et al. (2016)</td>
<td>34</td>
<td>12</td>
<td>Content: 12 Internal structure: 11 Other: 1 (cross-cultural)</td>
<td>12</td>
<td>Internal consistency: 11 Inter/intra-rater: 5</td>
<td>n/a</td>
</tr>
<tr>
<td>Granner &amp; Sharpe (2004)</td>
<td>20*</td>
<td>2</td>
<td>Internal structure: 2</td>
<td>10</td>
<td>Internal consistency: 10</td>
<td>n/a</td>
</tr>
<tr>
<td>Hamzeh et al. (2019)</td>
<td>6</td>
<td>3</td>
<td>Content: 3 Other: 2 (construct)</td>
<td>1</td>
<td>Internal consistency: 1 Test-retest: 1</td>
<td>4 possessed “good” to “excellent” evidence for the quality of origin (construct, dimensions, theoretical foundation)</td>
</tr>
<tr>
<td>Lawlor et al. (2019)</td>
<td>18</td>
<td>7</td>
<td>Content: 6 Internal structure: 3 Relations to other variables: 3 Other: 3 (face and construct)</td>
<td>5</td>
<td>Internal consistency: 5</td>
<td>n/a</td>
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Usability: whether a tool was easy to use. All 15 had a stated purpose, 9 were free, 8 were available in an applicable format, 7 included instructions for use, 2 were at an accessible reading level (7th grade)

Clinical utility: a rubric-based assessment of the clarity of instructions, whether the format was acceptable, and the time it takes to complete. 1 scored as “poor,” 14 as “fair,” 3 as “good,” 1 as “excellent,” and 14 as “unclear”

Quality of Initial Development: a scored checklist examining relevance, representativeness, clarity, specificity, and instructions availability. 3 provided “poor” to “good” evidence.

Ease-of-use: the achieved sample size and response rate. Of the 18 instruments, 6 drew on samples of less than 100 participants, 13 specified a response rate.
<table>
<thead>
<tr>
<th>Study</th>
<th>Items</th>
<th>Take</th>
<th>Content</th>
<th>Response process</th>
<th>Internal structure</th>
<th>Relations to other variables</th>
<th>Internal consistency</th>
<th>Other</th>
<th>Usability</th>
<th>Acceptability</th>
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<tbody>
<tr>
<td>Lewis et al. (2015)</td>
<td>104</td>
<td>46</td>
<td>Internal structure: 27</td>
<td></td>
<td></td>
<td></td>
<td>51</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td>Relations to other variables: 19</td>
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<tr>
<td>Sandoval et al. (2012)</td>
<td>34*</td>
<td>6</td>
<td>Content: 3</td>
<td></td>
<td>Internal structure: 2</td>
<td>Relations to other variables: 2</td>
<td>8</td>
<td></td>
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<tr>
<td>Squires et al. (2011)</td>
<td>60*</td>
<td>48</td>
<td>Content: 29</td>
<td>Response process: 23</td>
<td>Internal structure: 3</td>
<td>Relations to other variables: 28</td>
<td>14</td>
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<tr>
<td>Totals</td>
<td>291</td>
<td>132</td>
<td>Content: 53</td>
<td>Response process: 23</td>
<td>Internal structure: 48</td>
<td>Relations to other variables: 52</td>
<td>103</td>
<td></td>
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*Note. *denotes a total calculated in terms of measures rather than instruments.
Six of the included reviews (see Table 5.4) included an analysis of the pragmatic qualities of included instruments and measures. Of the 237 impact-focused measurement tools included in these six reviews, 171 (72%) provided or could be assessed for their pragmatic qualities. Each review used a different construct to represent such evidence, and the comprehensiveness of these constructs as a measure of pragmatic quality varied. Whereas ease-of-use, usability (Lewis et al.’s [2015] formulation), and acceptability captured information such as reported sample sizes and response rates, total survey length, time to complete an instrument, and missing data rates; usability (Boivin et al.’s [2018] formulation), clinical utility, and quality of initial development captured more nuanced information such as the availability and clarity of instructions, readability, and overall clarity. As with psychometric qualities, the pragmatic qualities of instruments and measures were modest, focusing primarily on whether the measurement tools were easy to use (e.g., item clarity, instrument length) rather than acceptable, compatible, or useful (e.g., able to inform decision making).

Consideration of the psychometric and pragmatic evidence led three reviews to offer recommendations about instruments and measures for future research and practice (Table 5.5). Additionally, for the other reviews, it was possible to generate recommendations based on the sources of evidence presented. In total, there were at least 27 measurement tools either endorsed by the authors of the reviews or outstanding among other tools included in the reviews based on psychometric and pragmatic qualities.
Table 5.5

Recommended Instruments and Measures

<table>
<thead>
<tr>
<th>Instrument and Measure Recommendations</th>
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<td>(provided by authors unless preamble)</td>
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Boivin et al. (2018)
- Top 3 based on psychometric and pragmatic evidence:
  - Public and Patient Engagement Evaluation Tool
  - Scoresheet for the Tangible Effects of Patient Participation
  - Organisational Self-Assessment and Planning Tool

Buchanan et al. (2016)
- Barriers to Research Utilization Scale
- Barriers and Attitudes to Research in the Therapies
- Edmonton Research Orientation Survey
- Questionnaire based on similar studies in other professionals
- Modified Knowledge, Attitude and Behaviour questionnaire
- Questionnaire on EBP and clinical effectiveness
- Questionnaire developed from Upton and Lewis (1998)
- Research Knowledge, Attitudes, and Practices Survey

- Not explicitly provided or clear from findings

Hamzeh et al. (2019)
- Top 3 based on psychometric and pragmatic evidence:
  - Community Impacts of Research Oriented (CIROP) Partnerships
  - CIROP Respondent Form
  - Partnership Indicators Questionnaire

Lawlor et al. (2019)
- School Nurse Evidence Based Practice
- Questionnaire about the use of research-based information
- Survey of Practitioners’ Use of Research

Lewis et al. (2015)
- Based on “total score” – a composite of psychometric and pragmatic evidence:
  - School-Wide Universal Behavior Sustainability Index-School Teams
  - Level of Institutionalization Scales for Health Promotion Programs
  - Practitioner's attitudes towards treatment manuals
  - The Pre-Referral Intervention Team Inventory

Sandoval et al. (2012)
- Instrument for evaluating dimensions of group dynamics within community-based participatory research partnerships
- Coalition Self-Assessment Survey

Squires et al. (2011)
- Multi-item measures with at least two or three validity sources:
  - Nurses Practice Questionnaire
  - Knott and Wildavsky Standards
  - Estabrooks’ Kinds of Research Use
  - Parahoo’s Measure

Discussion

This overview contributes to the study of co-production by drawing together multiple and diverse instrument reviews that have explored the quantitative measurement of impact. Based on
the qualities of the included reviews and the psychometric and pragmatic qualities of identified instruments and measures, a number of considerations can be set out for the development and use of measurement tools as well as the conduct and reporting of instrument reviews. For the purposes of this paper, only the former is addressed.

Beginning with the context in which measurement tools were developed and used, only one review targeted the education sector, whereas seven were identified for the health sector. For some time, it has been known that the health sector is leading the charge when it comes to the theory and praxis of mobilizing knowledge, and indeed co-production vis-à-vis the rich literature on integrated knowledge translation (e.g., Beckett et al., 2018; Nguyen et al., 2020). However, rather than seeing this as a failing of the education sector, it underscores the opportunity to engage in cross-sector learning about not only impact measurement in co-production, but also the strategies that can influence impacts, the links between theory and impacts, and the nature of involvement from different research stakeholders and how that modulates impacts (Gagliardi et al., 2016). Expanding considerations to the constructs and content themes of the included reviews, there are at least four additional opportunities to progress current scholarship and practice: (1) the development of more theoretically driven impact measurement, with specific focus on impact dimensions not well-represented in the present co-production landscape (e.g., the relationships between researchers and stakeholders, which can enable the re-distribution of material and symbolic resources; Williams, 2020); (2) increased attention to measurement tools being developed and used in Global South contexts, which accounted for less than 3% of primary studies; (3) the development of action-based and observational impact measurement tools (e.g., the nature and content of exchanges) to supplement the primarily self-report tools currently in use; and (4) continued attention to mixed methods approaches for integrating quantitative and
qualitative data sources when evidencing impact in order to support more rigorous, meaningful, and informative measurement, as well as to assuage some of the consequences that narrowly construed measures of impact can beget (Budtz Pedersen et al., 2020).

Turning to the quality of measurement tools, the findings of this overview suggest a general lack of attention to psychometric assessment, with fewer than 50% of tools providing sources of validity or reliability evidence. Validity is paramount in the development and use of a measurement tool, concerning the degree to which a tool measures what it is intended to measure. Without a strong theoretical and empirical basis for validity, the inferences and actions following from an instrument or measure cannot be assumed adequate or appropriate (Messick, 1995). The observed primacy of validity evidence based on relations to other variables and on content was unsurprising given that other forms are not always applicable; however, multiple reviews highlighted how instruments and measures that supplied such evidence did so in cursory ways (e.g., piloting the tool with a small sample; Lawlor et al., 2019). Reliability evidence, on the other hand, focused almost entirely on internal consistency, which has marked deficiencies as a measure of “quality,” such as sensitivity to the number of items. A key implication of these findings for validity and reliability is that future studies that measure aspects of co-production need to engage more openly and critically with measurement theory when designing, implementing, and reporting on measurement tools. Simultaneously, increased attention to the psychometric qualities of instruments and measures will be moot if attention is not similarly directed to pragmatic qualities. Consequently, future studies need also engage with the full constellation of factors influencing the pragmatic qualities of measurement instruments (e.g., see Stanick et al., 2021).
Limitations and Future Directions

Unlike the present study, it has become increasingly common for literature within the scope of co-production to involve research stakeholders as members of the research team (e.g., Hoekstra et al., 2020). Stakeholder involvement can ensure that research about co-production does not itself succumb to the shortcomings that collaborative research seeks to address. The next steps for this research will include developing more psychometrically and pragmatically robust measures for evidencing the impacts of co-production, wherein relevant stakeholders will play a core role.
Chapter 6
Discussion

The purpose of this study was to investigate the institutionally embedded knowledge mobilization (KMb) professionals who serve as the “human force” (Ward et al., 2009, p. 267) behind KMb efforts and capacity building in universities. To date, much of the empirical research in higher education has focused on either (a) the public policies driving research impact (e.g., Chirau et al., 2021; Gunn & Mintrom, 2021; Marceta, 2021; Williams & Grant, 2018), or (b) catalyzing the use of research and measuring its impacts (e.g., Budtz Pedersen et al., 2020; Edwards & Meagher, 2020; Smit & Hessels, 2021; Williams, 2020). Comparatively little is known about the complex professional practice of facilitating KMb. By collaborating with a leading practice-based KMb network, Research Impact Canada (RIC), by means of a developmental evaluation (DE), this study makes novel contributions to understanding the critical role these individuals play in KMb and how their professional networks are building KMb capacity within universities. This final chapter summarizes the findings of this study in relation to each research question, highlighting the empirical, theoretical, and methodological contributions of this research. From this basis, it provides suggestions for professional learning networks aimed at enhancing KMb, university administrators, and KMb professionals in universities.

Responding to the Research Questions

Research Question 1: What are the network learning experiences of institutionally embedded professionals who facilitate KMb within Canadian universities?

The first research question posed in this study was purposefully broad in scope and paired directly with the aims of the DE of RIC. It aimed first to uncover whether network learning in
this field of inquiry can lead to substantive conceptual and instrumental outcomes, with the former representing raised awareness, new understandings, and shifted attitudes, and the latter representing direct and observable changes to practice (Nutley et al., 2007). Second, it aimed to understand the broader challenges and opportunities for network learning in KMb, with an eye to understanding how universities can improve current efforts in this area. Finally, this question sought to interrogate how network learning could be structured to improve the likelihood that KMb concepts are used in practice.

1a. To what extent does a networked approach to building institutional KMb capacity result in learning that is useful and that contributes to the use of KMb concepts in practice?

At a general level, this study provides empirical evidence that a networked approach to building KMb capacity within universities can lead to useful learning experiences that positively contribute to the use of KMb concepts in practice. With the growing enthusiasm surrounding networks and networking in many disciplines (e.g., see Harris et al., 2021; Oliver & Faul, 2018), there is potential for this finding to seem like an expected outcome. In education, for example, scholars have observed the potential for professional networks to positively influence the connections between research, policy, and practice (Campbell et al., 2017; Brown et al., 2020; Briscoe et al., 2015); enable system stakeholders to navigate policy contexts that emphasize competition (Armstrong & Ainscow, 2018; Herrera-Pastor et al., 2019; Pino-Yancovic & Ahumada, 2020); and amplify the speed, depth, and breadth of change efforts (Liou & Daly, 2016; Liou et al., 2015; Rodway et al., 2021). However, within the context of universities and building KMb capacity within these institutions, the finding that network learning appears to produce value for those involved is noteworthy given that so little empirical research currently exists.
For the institutionally embedded KMb professionals in this study, the benefits of network learning accrued most perceptibly in terms of their conceptual understanding of KMb. This finding is consistent with the observations of Kothari et al. (2014), Finnigan et al. (2013), and Shearer et al. (2018), among others, who found that conceptual uses of research evidence—in this study, evidence about KMb practices—may be more common than, or perhaps precede (see Knott & Wildavsky, 1980), instrumental uses. In Chapter 2, for example, it was found that network learning promoted awareness of available tools and resources for KMb, general understandings of KMb practices, positive attitudes about KMb, and confidence in facilitating KMb efforts. In Chapter 3, it was found that network learning also promoted a sense of collective identity among KMb professionals around the concept of impact, enabling RIC members to feel they were not alone in the uncertainty and precarity of this line of work (e.g., Knight & Lightowler, 2010; Lightowler & Knight, 2013; van der Graaf et al., 2019; Watermeyer & Rowe, 2021; Wye et al., 2019). The findings of Chapter 4 brought this point into greater relief against the concept of professional capital (Hargreaves & Fullan, 2012). Specifically, when participants were asked to think about the recommendations they would give to early career KMb professionals, cultivating one’s connections on- and off-campus to other practitioners was considered essential to generating a deeper understanding of effective practices.

At the same time, evidence for direct changes to RIC members’ practices were not well-evidenced. Although the RIC members who participated in Chapters 2 and 3 were generally highly positive about their involvement in the network, multiple participants felt they could not reliably identify specific changes to their professional practice. There are several possible explanations for this result. First, it may be that RIC has little to no influence on its members’ practice. Given the recency of KMb as a field of study and practice, as well as the proliferation
of terms, models, and frameworks related to KMb (e.g., Esmail et al., 2020; Powell et al., 2017, 2018), it may be that RIC members struggle to connect network learning activities with their day-to-day practice. Yet, the evidence for this explanation is weak. In Chapter 2, for example, participants whose professional practice aligned with brokering-specific KMb activities reported that involvement in RIC had improved their ability to broker quality interactions between researchers and research users (p. 50). Furthermore, with the expanded sample of participants in Chapter 4, there was general agreement that RIC was having a positive influence on practice (pp. 104-106).

A second explanation could be that, as a network undergoing rapid expansion (growing from 14 to 23 institutions over the course of the DE), many participants may have joined too recently for the outcomes of network learning to have shifted from new understandings to altered decision-making processes and actions (see Cain et al., 2019). There is evidence to support this explanation in Chapter 2, which found that experienced RIC members were more likely to self-report having the KMb skills and tools needed for their practice as well as stronger perceptions about network participation leading to improved brokering-specific practices. It may also be that dedicated engagement (e.g., committee involvement, activity organization), rather than merely time affiliated with network, predicts the potential for RIC members to report practice change. However, evidence about the relationship between engagement and practice change will require further study that goes beyond general self-report measures.

Alternatively, a third explanation is that the direct outcomes of network learning may be difficult to pinpoint, similar to the observation that “neither research quality nor its impacts are straightforward concepts to pin down or assess” (Wilsdon et al., 2015, p. 14). There is widespread recognition that decisions and ensuing actions accrete from a diffuse array of inputs
without explicit systematic consideration, meaning they “often take shape gradually, without the formality of agenda, deliberation, and choice” (Weiss, 1980, p. 382). Identifying direct changes to KMb practices from network learning is likely to require the application of methods specifically designed to untangle the complexity of change processes, such as realist evaluation and contribution mapping (e.g., see Greenhalgh et al., 2016).

Finally, the limited evidence of instrumental outcomes could be attributed to the study’s design, which ultimately aimed to generate broad insights about the experiences and perspectives of institutionally embedded KMb professionals. Moreover, respecting the utilization focus of DE (Patton, 2011), an underlying goal of this research was to support the ongoing development of RIC. Accomplishing this goal required starting with a broad analysis of the network’s enabling conditions and activities (see Appendix A) rather than an in-depth examination of the individual member institutions. Future studies, which are already a discussion topic with key leaders of RIC, are needed to take up this transition from an overarching network level of professional learning to the outcomes of individual member institutions. However, both lines of inquiry will remain essential to developing the full picture of KMb in Canadian universities.

1b. What are the broader challenges and opportunities of a networked approach to building institutional KMb capacity?

Network learning is not a panacea to the challenges researchers and institutions face regarding KMb and research impact. As Brown and Poortman (2018) stress, “participation in learning networks does not automatically improve practice, with research indicating that many factors need to be in place before networks can be successful” (p. 2). The participants in this study were forthright that simply participating in the RIC network was not a guarantee that they or their institutions would garner benefits. Recent studies illustrate that myriad factors influence
how universities and researchers engage in KMb (e.g., Cain et al., 2018; Cooper et al., 2018; Cvitanovic et al., 2018; Fischman et al., 2018; Sá et al., 2011; Zuiker et al., 2019). However, whereas these previous studies focus primarily on the perspectives of researchers and university administrators, this study brings to light the perspectives of professional staff who facilitate KMb.

The main challenge with network learning for participants in this study—and also the factor which offered the greatest potential value, as explained below—was the heterogeneity of RIC’s membership. It has been known for some time that Canadian knowledge intermediaries vary in their efforts and organizational characteristics (see Cooper, 2014). And when it comes to how that variability manifests in networks, it is common to hear how it serves as a boon for collective action (e.g., Muijs et al., 2010; Nichols et al., 2020; Oliver & Faul, 2018; Shearer et al., 2018). However, a highly heterogenous network can also “be a ‘double edged sword’ to milestone dominated, output driven agencies and organizations” (Beacham et al., 2005). The current study found that the KMb professionals of RIC were grappling with high levels of variability in terms of (a) their KMb practice areas and discourses of impact, and (b) where their respective institutions fell on a spectrum ranging from primarily centralized approaches to supporting KMb efforts to primarily decentralized approaches. In Chapter 2, for example, participants identified with a wide range of labels to describe their institutional roles (e.g., knowledge broker, knowledge steward, research communicator), and Chapter 3 illustrated how that role diversity extended into participants’ facilitative actions. At times, such diversity made it difficult for RIC members to find broadly focused network learning activities relevant or see how the network goals aligned with institutional goals regarding KMb. Similarly, for the factor of (de)centralization, it was found that when KMb professionals looked to share insights about
promising practices, they had to contend not only with their universities’ different capacities and attributes (see Cvitanovic et al., 2018), but also the extent to which those were distributed throughout an institution and how, as a result, certain practices may fail to elicit expected outcomes. It may be reasonable to suggest, then, that when it comes to building institutional KMb capacity, the present enthusiasm around networks—what Portes (1998) called “unmixed blessings” (p. 15)—might best be accompanied by candidness about their potential pitfalls and further study of how those take form.

Another challenge with network learning was the potential for it to be crowded out by institutional commitments or constraints. By their nature, multi-institutional networks are step removed from the participating organizations. What this meant for participants in this study is that if institutional leadership did not have confidence in the potential benefits of network learning, less time and fewer resources (e.g., material, financial) were allocated in that strategic direction. Moreover, as identified in Chapter 2, several participants were struggling with institutional leadership that were dubious of not only network learning, but also the value of dedicated KMb roles in general. These findings corroborate similar studies about the institutional limitations experienced by researchers (e.g., Fischman et al., 2018; Sá et al., 2011) and, more recently, KMb professionals (e.g., Watermeyer & Rowe, 2021). As Watermeyer and Rowe (2021) argue,

The mobilisation of professional services as a critical community is, however, no easy task, given that their identity – unlike academics – is tightly bound with that of their institutions; where their roles are so diverse and disparate as to make them at best an inchoate collective; where they lack the same (however challenged and eroded) privileges of freedom and autonomy afforded to academics; and where also their union participation
and thus ability to collectively-organise is, we would speculate, far less than their academic counterparts. (p. 11)

While this elucidation concerns public engagement professionals in UK universities, it also aptly describes the experiences of the KMb professionals in Canadian universities who participated in this study. Hence, it may the case that the aphorism “you get out what you put in” has real-world implications for Canadian universities seeking to build KMb capacity, particularly when it comes to providing dedicated time and resources for KMb professionals and their professional networks.

As alluded to above, participants in this study simultaneously viewed the heterogeneity of RIC’s membership, at both the individual and institutional levels, as the central factor underlying the opportunities of network learning. Member diversity put participants in an advantageous position to question each other’s assumptions and interpretations about various KMb practices. Through RIC’s structured and unstructured learning activities (see Chapter 2, pp. 38-40), these rich conversations could ultimately lead to more usable knowledge, similar to the network learning outcomes Nichols and Gaetz (2014) observed for a homelessness research network in Canada. Additionally, similar to Nichols et al.’s (2020) study of Canadian knowledge intermediary organizations in homelessness research networks, RIC’s heterogeneity enabled its members to more quickly produce, find, and disseminate evidence about their KMb practices. This ability is salient given the limited empirical evidence that exists for most areas of practice in KMb (e.g., Davies et al., 2015; Posner & Cvitanovic, 2019) and the resultant potential for “duplication and ‘reinvention of the wheel’” (Powell et al., 2017, p. 218). However, further research is needed at finer-grained levels of analysis (individual institutions, units, and professionals) to understand the relationship between access to practice-based evidence and
institutional outcomes as well as how practice-based and research-based evidence for KMb can complement one another.

Additionally, beyond critically analyzing existing practices, network diversity enabled participants to comprehend a wider universe of KMb practices and institutional structures to support those practices. In Chapter 3, for example, this finding can be observed in the network’s “ethos of impact.” Although the members of RIC each come to the network with a unique institutional remit for KMb, the network enables them to observe the full spectrum of technical and relational competencies (see also Bayley et al., 2018; Straus et al., 2011; Mallidou et al., 2018). The findings of Chapter 4 further cemented how this was a critical function of the RIC network. Specifically, participants stressed how it was essential to cultivate a systems perspective in KMb, which in part meant developing an awareness of the situational appropriateness of different practices as well as the potential for their effectiveness to wax or wane over time (e.g., as the priorities and information preferences of local research partners shift). Membership in the RIC network provided an avenue to develop such awareness by learning from the varied successes and failures of other members. These results reinforce the findings from earlier and related studies by Shearer et al. (2018) and Jessani et al. (2018), who found that heterogenous KMb networks increase exposure to new ideas, reveal new avenues for understanding systems change, and bolster the overall resilience of the network. At the same time, the field of KMb is diversifying (Davies et al., 2015), and the questions that professionals need to grapple with in their practice (e.g., “how do you mobilize knowledge”; see Ward, 2017) will have increasingly complex answers. Further research is needed to investigate how network learning can keep pace with the unique needs of different KMb professionals and what new structures and activities may become essential as this field of practice continues to evolve.
1c. How can network learning to develop institutional KMb capacity be structured to improve the use of KMb concepts in practice?

In the pursuit of improving the use of KMb concepts in practice, there is grounds to ask how the structure of network learning among KMb professionals can also be improved. This question gets at the issue Daly and Stoll (2018) described as “moving a community of learners to become a community that learns” (p. 206). Although there exists no shortage of empirical research on the structures and activities of networks, the circumstances surrounding networked KMb professionals such as those in this study remain largely uncharted. As a result, it is helpful to draw from cognate literatures, with the recent work surrounding professional learning networks (PLNs) providing one promising inroad. Brown and Poortman (2018) define PLNs as groups “who engage in collaborative learning with others outside of their everyday community of practice . . . in order to improve teaching and learning in their school(s) and/or the school system more widely” (p. 11). It is plain to see how this definition aligns with networks like RIC, apart from the focus on schools and school systems: the membership comprises KMb professionals from different universities that come together to build the KMb capacity of their respective institutions and the Canadian higher education sector in general. Beyond the abovementioned challenges and opportunities of network learning for these professionals, Daly and Stoll (2018) suggest five areas and future directions to give attention for PLNs: (a) working toward conceptual clarity, (b) ensuring depth and breadth of learning, (c) exploring how technology can enhance PLNs, (d) paying attention to the conditions to support relational space, and (e) moving towards a systems perspective. This study contributes to each of these areas in which research is needed and draws attention to additional lines of inquiry that will be critical to building institutional KMb capacity through network learning.
**Conceptual Clarity.** There is an emerging consensus among social scientists that networks can serve as a promising strategy to promote KMb efforts (e.g., Cooper & Levin, 2010; Jessani et al., 2018; Oliver & Faul, 2018). At the same time, Rodway (2015) notes that within this field, “what a network looks like remains an underdeveloped concept” (p. 20). Many terms are often used interchangeably with *networks*, such as partnerships, inter-organizational relationships, and strategic alliances (Provan et al., 2007); the concept has what West et al. (2015) called “an awkward multiple character” (p. 108). This conceptual variability can constrain efforts to build up insights about what makes different network structures and activities effective or detrimental for professional learning. This issue relates to Elinor Ostrom’s writings that when social scientists are inconsistent in their language about analytic concepts, it can unduly limit a broader understanding of the phenomenon under study due to a focus on different theoretical levels (Ostrom, 2005; Ostrom et al., 2014).

Participants in this study were clearly thinking about RIC as a *network* in the sense that it centered connections and relations (Borgatti et al., 2018). Moreover, in step with the “professional learning” portion of the PLN concept, participants consistently viewed RIC as an influential factor in improving their understanding of KMb, and potentially their professional practices (Chapter 2, pp. 49-52). However, several factors were less clear: (a) how they viewed their professional learning in RIC as similar to or different from other professional networks on and off campus, (b) how their involvement in more informal learning networks compares to that of formal learning networks like RIC, and (c) the extent to which their perceptions of RIC as a network enabled them to think about their professional learning therein from a structural perspective (e.g., core and peripheral actors, subgroups of connected actors; Fliaster & Spiess, 2008; Glegg et al., 2019). Future research will need to interrogate these factors on the path to
greater conceptual clarity about how concepts such as “networks” and “PLNs” can promote a deeper understanding about the dynamics of entities like RIC.

**Depth and Breadth of Learning.** A recent theme in network learning scholarship is that both general and specific learning opportunities help to advance professional practices (e.g., Anderson et al., 2019; Bunger et al., 2018; Russell et al., 2021). In RIC, breadth of learning was ensured through activities such as those at the annual general meeting (e.g., building common understandings of KMb, discussing common institutional barriers, collectively analyzing what it means to be involved in the network). Depth of learning, by contrast, was ensured through activities that focused on specific practice areas or tools (see Chapter 2, pp. 38-40). This dual focus on breadth and depth was well received by RIC’s membership, yet there was evidence some members felt that depth-related activities showed an inclination towards brokering-specific KMb practices, meaning some practice areas were not as well covered (Chapter 2, p. 47). At the conclusion of Phase I of the DE, it was thus suggested that the network could trial *practice-based subgroups* to enhance the value of network membership.

The underlying idea of these practice-based subgroups was that they would enable RIC to simultaneously support the diverse learning needs of its membership while upholding the network’s broad vision (see Appendix A). In this way, the subgroup structure was intended to foster increased collaboration and the deprivatization of practice—factors known to be influential in the outcomes of network learning in education (e.g., Farley-Ripple et al., 2014; Sleegers et al., 2013). However, the initial positive regard for practice-based subgroups in Phase I of the DE seemed to wane upon further investigation of this structure in Phase II (Chapter 3, Table 3.1). One reason for this reversal appeared to be participants’ concern that adding yet another structure to network learning could begin unraveling RIC’s sense of unity, as well as
complicate participation for members already overburdened at their respective institutions (Chapter 3, pp. 78-79). It may also be that when contrasted with the other learning opportunities of RIC, which are primarily member driven (i.e., members can choose to join or abstain from network learning opportunities), the notion of subgroups seemed too likely to push the network in the direction of top-down change, risking “contrived collegiality” (Hargreaves, 1994, p. 195). In either case, the introduction of this new structure was deemed inappropriate for the network’s current developmental phase. Future research is needed on the long-term development of networks like RIC to better understand the emergence and extinction of different network structures and processes and how they track with different developmental milestones.

**Technology in PLNs.** Technology use in RIC was not a focal point for the chapters in this dissertation. However, its relevance to network learning did surface in several ways throughout the DE (see MacGregor, 2019). Most prominently, RIC holds only one in-person meeting each year, and the COVID-19 pandemic has meant that even this meeting transitioned to an online environment in 2020 and 2021. Online communication mechanisms (e.g., email, video conferencing software) are thus central to building connections among network members. Data collected during Phase I of the DE suggested that while the network was performing well in most areas of technology use (e.g., frequency of communications, timely distribution of materials, maintaining formal contact), two areas were lacking in the eyes of participants: (a) the use of technology to maintain informal contact between members, and (b) the use of document repositories to facilitate accessing, using, and commenting on network resources. The combined influence of these issues alongside the findings from Phase II of the DE that some RIC members are interested in trailing a new platform for sharing network resources (i.e., Yaffle, Table 3.1), suggests that this area will be essential for RIC’s future evaluative efforts. Moreover, as Daly
and Stoll (2018) point out, the ubiquity of social media and online tools to create and strengthen social connections is only increasing with time. Hence, it seems likely that most PLNs would benefit from exploring how technological tools can augment, modify, or redefine in-person professional learning opportunities.

**Relational Space.** Continuing with the issue of conceptual clarity discussed above, network learning is fundamentally a relational process (Nichols et al., 2020; Oliver & Faul, 2018; Rodway, 2019; West et al., 2015). As such, beyond the collective development of human capital (i.e., individual skills and competencies), a network finds its value in the “resources embedded in a social structure which are accessed and/or mobilized in purposive actions” (i.e., social capital; Lin, 1999, p. 35). Evidence about the importance of relations was observed on several occasions in this study. Specifically, participants spoke about the importance of different types of relations (Chapter 2, p. 38), structured and unstructured network learning opportunities to cultivate those relations (i.e., network flexibility and stability; Chapter 3, p. 69-69), and the broader ecosystem of relational spaces in which their professional work takes place (i.e., cultivating a systems perspective; Chapter 4, pp. 101-104). And yet, this study did not explicitly interrogate those relations from a social network perspective, which “encompasses theories, models, and applications that are expressed in terms of relational concepts or processes” (Wasserman & Faust, 1994, p. 4). There are two reasons for this design choice. First, although social network analysis (SNA) was an early consideration in the DE, network leaders were concerned about (a) their relevance for understanding the most pressing concerns of RIC, and (b) how those methods might be perceived by the membership before trust was established with the external evaluator. Second, heeding the advice of leading network scholars, before employing
SNA, it was necessary to determine what types of relations would be appropriate to study—the first step in constructing what Borgatti et al. (2018) call the “ethnographic sandwich” (p. 54).

Looking to the future, it will be necessary to transition from a focus on the external conditions that support network activity to the internal dynamics that enable or constrain professional learning in networks like RIC (Rodway, 2018). Building upon this study and recent work that employs a social network perspective in the study of PLNs and KMb (e.g., Brown et al., 2020; Rodway et al., 2021), future research could contribute to several lines of inquiry:

- How the quality and multiplexity of network relations relate to learning outcomes at the individual, institutional, and network levels;
- How institutional KMb capacity is built up through the contributions of individuals in both formal and informal KMb roles;
- How the structure and content of social relations for KMb change over time and what that dynamism means for the individuals and institutions involved; and
- How social network theories (e.g., social contagion theory, social capital theory, Granovetter’s strength of weak ties; Glegg et al. 2019) could enrich current understandings of KMb practices as well as network learning to build KMb capacity.

**Systems Perspective.** A systems perspective recognizes that “systems are dynamic and constantly changing; systems themselves exist within other, interdependent systems (eg individual, organisation, community); [and] changes in one part of the system can have unexpected changes in other parts of the system;” (Best & Holmes, 2010, p. 148). The growing attention to systems in KMb represents an ongoing shift from traditional approaches to change that seek to control or manipulate social systems (Holmes et al., 2017) towards more contingent, relational approaches (Kitson et al., 2018). Evidence that RIC members are grappling with the
implications of this shift is directly represented in Chapter 4, in which one of the participants’ top recommendations for institutional KMb professionals was to cultivate such a perspective. There was also indirect evidence via the four network learning tensions discussed in Chapter 3: flexibility and stability, openness and efficiency, unity and diversification, self-interest and collective interest. However, these findings should be interpreted with caution, as they could give the impression that adopting a systems perspective is straightforward or a simply a background process of KMb.

In reality, embracing a systems perspective in KMb is a highly active process in which change is considered an emergent phenomenon and scholars and practitioners must contend with “the inevitable arbitrariness of boundaries, a variety of perspectives, and dynamic, entangled interrelationships” (Patton, 2011, p. 122). In both the focal area of this research and the wider field of KMb, there are core uncertainties about systems thinking within KMb that will need to be addressed in future research (see also Best & Holmes, 2010; Carey et al., 2015; Freebairn et al., 2017; Haynes et al., 2020):

- How a systems perspective can enhance or distract efforts to build KMb capacity at the individual, institutional, and network levels;

- How “good systems-informed KMb practice” (Haynes et al., 2020, p. 14) can be observed in terms what that means conceptually as well as what methods and analytic tools are needed; and

- How systems-informed KMb practices compare with other KMb practices.

Additionally, taking a systems perspective seriously within the context of professional learning to build institutional KMb capacity will require attention to (a) how institutional KMb professionals are distributed across university contexts (Bogenschneider, 2018; Dobbins et al.,
2018; Jessani et al., 2018); (b) what roles they enact to cultivate connections among research production, mediation, and use contexts (Cummings et al., 2018; Cvitanovic et al., 2017); (c) the specific KMb activities they employ (Halevy et al., 2019; Van Eerd et al., 2016); and (d) how they foster research impact beyond anecdotal or theoretical accounts (Bornbaum et al., 2015; Mackillop et al., 2020).

**Research Question 2: What quantitative measurement tools (instruments and measures) have been used to measure impact in fields of study related to co-production?**

The second research question of this thesis developed in response to a problem of practice expressed by the KMb professionals included in this study. Namely, beyond qualitative assessment strategies such as impact case studies, participants were struggling with identifying promising quantitative measurement tools for the impacts of research co-production. And they were not alone in seeing this as an uncertain area of research and practice. The past five years has seen a rapid increase in the number of studies about measuring research impact, focusing on topics such as conceptual clarity (e.g., Belcher et al., 2021; Farley-Ripple, 2020; Woolcott et al., 2020), models and frameworks (e.g., Louder et al., 2021; Razmgir et al., 2021; Reed et al., 2021; Williams & Lewis, 2021), methods (e.g., Budtz Pedersen et al., 2020; Reale et al., 2018; Smit & Hessels, 2021), and general principles and guidelines (e.g., Adam et al., 2018; Gunn & Mintrom, 2017; Kamenetzky & Hinrichs-Krapels, 2020). Similarly, interest in research co-production as a promising approach to KMb has burgeoned, with recent studies focusing on its principles, strategies, and impacts (e.g., Durose et al., 2018; Hoekstra et al., 2020; Norström et al., 2020); potential issues that arise from conflating it with other forms of collaborative research (cf. Nguyen et al., 2020; Oliver et al., 2019; Williams et al., 2020); and what exactly is being co-produced (e.g., Filipe et al., 2017; Wolstenholme et al., 2019). The overview of Chapter 5 was
positioned at the intersection of these bodies of literature, with aims of (a) simplifying what has become a difficult topic to parse for KMb practitioners, and (b) informing the development of measurement tools with strong psychometric and pragmatic qualities.

A total of eight reviews about the quantitative measurement of impact for constructs with theoretical similarities to co-production were identified in the extant literature. These eight reviews, published between 2004 and 2019, described 441 instruments and measures designed to capture the various aspects of knowledge being mobilized among diverse research stakeholders. Analysis of these reviews focused on the contexts in which measurement tools have been used, their main constructs and content themes, and their psychometric and pragmatic qualities.

Regarding the contexts use, seven of the included reviews focused on the health sector, while one review focused on the education sector. Most of the measurement tools included in these reviews were developed and used in either North America (60%) or the UK and Europe (30%), with less than 3% originating or finding use in Global South contexts. This latter disparity is one well-documented in other areas of the co-production literature (e.g., Durose et al., 2018, Lebel & McLean, 2018; Oliver et al., 2018). Although many countries in the Global South sit on the front lines of global challenges like climate change (Lebel & McLean, 2018), and thus have unique contextual factors to contend with when it comes to co-production, stakeholders in these contexts are “being overwhelmed by ways of knowing developed to suit the Global North” (Oliver et al., 2018, p. 30). Accordingly, one of the overview’s takeaways was that future scholarship in this area would benefit from exploring how co-production impacts are being studied and measured in the Global South.

Each review examined a different construct: patient and public engagement, evidence-based practice learner outcomes, coalitions and community partnerships, organizational
participatory research, use of research evidence, implementation outcomes, community-based participatory research, and research utilization. Despite the recent uptick in interest surrounding co-production—what Williams et al. (2020) called “cobiquity”—no reviews used it as the primary construct for identifying and examining measurement tools. Six of the included reviews connected their respective constructs to specific measurement themes using a deductive approach, while the other two used an inductive approach. Analysis of these themes suggested that 291 (66%) of the measurement tools exhibited relevance for measuring impact. Contrasting how each review categorized these tools against Hoekstra et al.’s (2020) typology for the outcomes and impacts of partnered approaches to research (of which, co-production is included), the reviews described impacts captured at the stakeholder level (n = 8), followed by the relevant community or society (n = 6), relationships between researchers and stakeholders (n = 3), and then researchers (n = 2) and the research process (n = 2). Respecting that Phipps et al. (2016) argue impact must ultimately be measured at the stakeholder level, this distribution among the reviews is reassuring in a sense. However, it also brings into focus areas of measurement that require more attention. As Greenhalgh et al. (2016) explain, co-production implies that all stakeholders have a say in “the framing of the program, the quality of relationships, and governance and facilitation arrangements” (p. 418). Future research will thus need to give more attention to designing and testing measurement tools that target how co-production impacts the relationships between researchers and external partners, researchers’ perceptions of the research process, and how the nature of the research process may change or evolve. Particular focus is needed on deepening our understanding of co-production as a construct, appreciating its economics and public policy origins alongside its broader contemporary usage to signify different forms of collaborative interaction between researchers and external partners.
Shifting focus to the psychometric qualities of measurement tools included in the eight reviews, only 45% of instruments and measures were supplemented with any form of validity evidence, and only 35% with any form of reliability evidence. Considering that 82.8% of the primary studies included in the reviews were published before 2010, it seems that too little attention has been paid to these psychometric qualities that establish whether a tool measures what it intends to measure (validity) and whether it has consistent response patterns (reliability). At the same time, the overview did identify 27 measurement tools that were outstanding with their respective reviews. An immediate next step for this research will be to (a) examine the psychometric qualities of these tools in greater detail, including how they have been used; (b) contrast the findings with more recent understandings of co-production, as well as more recent measurement tools if they exist; and (c) depending on the findings, provide recommendations for designing more adequate and appropriate instruments and measures.

Finally, six reviews examined the pragmatic qualities of measurement tools; yet, there was little coherence in what made an instrument pragmatic in practice settings. While some reviews analyzed the basic qualities of included tools (e.g., survey length, time required to complete), others analyzed more nuanced concepts like usability. In general, the reviews suggested that most measurement tools had modest pragmatic qualities, meaning that while they were not likely to create undue burden when used, there was ample room to improve the likelihood they would produce useful information (e.g., by avoiding respondent fatigue). With the recent advent of criteria to support the development and implementation of pragmatically strong measurement tools (e.g., the Psychometric and Pragmatic Evidence Rating Scale; Stanick et al., 2021), future research should explore how more pragmatic impact measurement in co-production could fortify rather than intrude upon co-production processes.
Recommendations

This final section presents recommendations for networks, university administrators, and KMb professionals faced with the problem of how to build institutional KMb capacity. It also presents considerations for research funders and governments given their role in setting strategic priorities and expectations for KMb and impact within research systems.

Networks

At a general level, networks that aim to build capacity in KMb could first benefit from building awareness of the broad spectrum of KMb practices and competencies emerging and in use in different practice contexts. Depending on the needs of network members, it may also become necessary to explore how subgroups in specific practice areas (e.g., brokering, research communication, impact librarianship) could improve the usefulness of network learning opportunities and the use of KMb concepts in practice. Furthermore, the value proposition of network learning could be bolstered by paying attention to developing not only members’ technical capacity with KMb (e.g., understanding how to assess outcomes), but also their relational capacity (e.g., understanding how to build trust among research partners).

Networks that connect the diverse practice and research contexts of KMb, such as RIC, are in a strategic position to build up the evidence base in this field of inquiry. To take advantage of that position, networks should consider the following:

- their role in building the evidence based for KMb through theory-informed perspectives (e.g., realism) and methods (e.g., SNA) as well as psychometrically and pragmatically strong measurement tools;
• how KMb concepts can be taught in ways that raise baseline understandings on- and off-campus, and which help to ensure that the expertise of KMb professionals can be effectively utilized; and

• how to continually seek balance in the tensions acting upon their work (i.e., flexibility and stability, openness and efficiency, unity and diversification, self-interest and collective interest).

The tensions on network learning may be a particularly salient factor in achieving long-term objectives, as the findings from this study suggest they lie at the very core of working in a network. By their nature, they cannot be abolished, as no collaborative arrangement of people or organizations is free from grappling with, for example, questions such as the parameters of membership. Networks may benefit from exploring the spectrum of each tension, consistently seeking a balance appropriate for the membership while appreciating that the balance point will inevitably change with time.

**Universities**

University administrators could respond to the issue of building KMb capacity by heeding Brown and Flood’s (2019) general recommendations for how institutions can maximize the benefits of network learning, which suggest it needs to be:

1. **Formalized**, ensuring its value is recognized in institutional priorities regarding KMb and not “sidelined by other improvement initiatives” (Brown & Flood, 2020, p. 138; see also Chapter 3, pp. 81-83);

2. **Prioritized**, ensuring adequate resources are allocated for meaningful participation in network learning activities and the diffusion of new understandings and KMb practices among other institutional actors (see Chapter 2, pp. 54-55); and
3. **Mobilized**, ensuring skilled individuals and groups within institutions can access and collaboratively trial and refine new KMb practices, ultimately increasing the capacity of the institution and the network (see Chapter 4, pp. 109-111).

In addition to these general recommendations, it would also be beneficial to cultivate a systems perspective as discussed in Chapter 3, paying mind to the various ways KMb is already happening on- and off-campus, the various stakeholder groups involved, the resources available to support KMb, and the governance systems that may facilitate or constrain current and future KMb efforts.

**KMb Professionals**

Beyond the recommendations featured in Chapter 4 (pp. 101-106), KMb professionals would do well to advocate for their institutional roles and the resources needed for their line of work. However, as Watermeyer and Rowe (2021) highlight, “without clear evidence of a tangible hard return on investment, [KMb] as a formal strategic priority will likely continue to flounder and the vast majority of its activity will remain invisible” (p. 11). This issue is compounded by the fact that many of the extant frameworks and models for KMb have not seen empirical application, or if they have, it often occurs “in more diffuse [and undocumented] ways” (Powell et al., 2017, p. 217). As frontline practitioners, KMb professionals could play a key role in addressing these interrelated issues, and thereby advance the evidential argument for their value in universities. At least three opportunities to begin this work can be seen in the example set by RIC:

1. For individuals who already have institutional support for their work and resources at hand, they could take a leading role in generating evidence about their KMb practices;
2. Similarly, for those individuals who have access to professional networks with a KMb focus, they could advocate for the network to make building the evidence base for KMb a strategic priority; and

3. KMb professionals could seek out research-practice connections with KMb researchers, such as the collaboration with RIC that made this work possible.

It should be noted, however, that operationalizing these opportunities will first require the field as a whole to consider (a) how practice-based evidence can complement evidence produced through more traditional research and evaluation methods; and (b) how this evidence can be reviewed, compiled, and shared in systematic ways.

**Governments and Research Funders**

Although governments and research funders are not coupled in all research systems, they nonetheless share an agenda setting role in terms of how universities and KMb professionals consider and engage in KMb efforts. Hence, there are several recommendations arising from this research that are relevant for both stakeholder groups. First, respecting Bayley and Phipps’ (2019b) revised model of impact literacy (see Figure 4.1), it is crucial to develop a baseline understanding of why impact is being pursued, including “fundamental inceptive questions around ethics, values and power relationships and the overall purpose of the impact” (p. 9). For example, regarding the issue of ethical considerations for research impact, any efforts to promote KMb by improving the relationships between researchers and non-academic partners would need to respect past or existing power dynamics and how those may negatively influence potential outcomes. As Derrick et al.’s (2018) interrogation of “grimpact” revealed, the impacts resulting from research are not always positive, and thus generalized efforts to promote KMb may inadvertently advance negative impacts alongside positive impacts. While it is unlikely grimpact
can be entirely avoided, there is little basis to suggest research systems would benefit from ignoring its potential or relegating its abatement entirely to universities and researchers.

Another recommendation for governments and research funders is to cultivate an awareness of the various KMb-related efforts and outcomes in other research systems (e.g., the UK’s Research Excellence Framework, the Netherland’s Standard Evaluation Protocol, Australia’s Excellence in Research for Australia; Budtz Pedersen et al., 2020; Williams & Grant, 2018). Smits and Dennis (2014), for example, found that among 13 health research funding agencies in six countries, there existed considerable variation in the models, definitions, approaches, and measures used for science integration in policy. More recent research by McLean et al. (2018) similarly found a diversity of KMb experiences among 26 health research funding agencies in Australia, Europe, and North America. Rather than suggest there should be international convergence in KMb priorities and activities—which may nonetheless be a consequence of the impact agenda, as intimated by McLean et al. (2018)—this diversity could potentially provide a catalogue of approaches that generate desirable outcomes under different circumstances. At the same time, there remains a need for more evaluations of KMb efforts as well as the increased documentation and communication of evaluation findings. Without targeted efforts to build the evidence base for KMb, universities and KMb professionals will continue to struggle with theory-practice gap that has persisted too long for a field concerned with the mobilization of knowledge.

Finally, focusing specifically on the Canadian context, the findings from this study indicate several alternatives to the status quo that may enable research funders and government actors to better support universities and KMb professionals in building institutional KMb capacity. One alternative would be to increase internal operating budget of research funders at an
amount proportionate to developing a KMb and impact department, using other funding agencies with such a department as a point of reference (e.g., the Australian Research Council; Shewchuk et al., 2018). A second alternative would be to implement regulatory action directed at universities who receive research support funding (e.g., the Research Support Fund of the Social Science and Humanities Research Council [SSHRC] of Canada), requiring the hiring, training, and retention of institutional staff with expertise in KMb and impact. A third and final alternative would be to establish multifaceted interventions that draw upon the seven mechanisms discussed Walter et al. (2003): dissemination, educational interventions, social influence, collaborations, incentives, reinforcements of behaviour, and facilitation. Interventions could be designed that build upon the emerging evidence base for KMb and which are attuned to the broader social, economic, and political contexts. For example, prior to yearly funding deadlines, SSHRC could offer combinations of (a) educational materials about KMb approaches and activities that were effective in funded studies, (b) group education on KMb and impact as well as ongoing practice-based supports (e.g., institutional KMb resources), and (c) educational KMb and impact outreach to university research offices.

**Limitations**

In addition to the limitations described throughout the individual chapters, there are several general limitations of this study that bear consideration when interpreting the findings. The most important limitations follow from DE design. Although DE “can be a boon to social innovation” (Patton, 2016a, p. 2), it also presents a number of challenges and trade offs when compared with other research and evaluation designs. First, a DE must focus of “intended use by intended users” (Patton, 2016b, p. 256), which implicitly acknowledges that academic interests must at times be either temporarily suspended or modified. In this study, the needs and interests
of RIC were predominately coincident with my own; however, there were instances where potentially revealing approaches to data collection were postponed as they did not accord with RIC’s immediate needs and constraints. The prime example of this was the decision against using SNA to investigate the relational space of RIC’s network. Although SNA would provide insight into the relational patterns within the network and how social infrastructure may enable or constrain flows of resources (e.g., information, materials; see Borgatti et al., 2018), the approach was determined inappropriate for the networks developmental stage at that time. However, given the rapid growth of RIC over the course of the study, and the potential emergence and dissolution of professional relationships, it may indeed be the case that the methodological toolset of SNA was better suited for a future study.

A second limitation of this study followed from the co-creation principle of DE. As KMb scholars have stressed, co-creation is not a panacea to the challenges of achieving impact with intended audiences (Beckett et al., 2018)—in this case, RIC. Oliver et al. (2019) describe how co-creation can precipitate practical costs (e.g., increased financial requirements), personal costs to researchers, professional costs to researchers, costs to research, costs to stakeholders, and costs to the research profession. While few such costs arose in this study, one prominent cost was the time required to do co-creation well, ensuring that all participants who might be interested in contributing to the DE were provided that opportunity. At times, this meant the co-creation principle was in tension with the timely feedback principle, meaning that participants who might have benefitted from more immediate updates about the DE’s findings, but who were not able to become directly involved in co-creation, had to wait for official findings communications. While there was no clear evidence that such instances negatively impacted the study, it was an ever-
present tension that required consistent scrutiny to ensure the DE supported RIC’s ongoing adaptation.

A third limitation of the DE design stemmed from the challenges of operationalizing the systems perspective principle. In practice, Patton (2011) explains that embracing a systems perspective requires that an evaluator is “attuned to both linear and nonlinear relationships, both intended and unintended interactions and outcomes, and both hypothesized and unpredicted results” (p. 120). While each of these elements—relationships, interactions and outcomes, and results—were constantly monitored and played a key role in decision making about the study design and reporting structures, the scope of inquiry necessarily traded depth for breadth. Taking Patton’s (2011) “levels of development inquiry” (p. 120), for example, this study touched upon each of the three levels (individuals, organizational systems, and societal values), without being highly focused on any one level. While design choice was necessary given time and resource constraints, it means that the findings from this study are part of a much larger story about how university-embedded professional staff are engaging in KMb capacity building in Canadian universities.

A final limitation to note with the DE design is that the findings from this study are not generalizable. The DE focused on RIC’s unique circumstances and contexts, which means the findings are to some degree localized to this specific case. However, this study nonetheless yielded valuable insights that may be applicable in other contexts where research organizations are looking to collaborate around KMb capacity building.

**Conclusion**

To meet the challenges universities and researchers are facing regarding the increasing expectations for KMb and research impact, it is essential to learn from the frontline professionals
who operationalize KMb efforts. These individuals occupy a critical intermediary position between research production and use contexts, yet very little is known about their experiences and perspectives on building institutional KMb capacity. Even less is known about their professional networks that aim to build KMb capacity at scale. This dissertation contributes to these gaps in the literature by studying the case of Research Impact Canada and its institutionally embedded KMb professionals. It finds that network learning can offer a critical mechanism for KMb professionals and universities to enrich understandings about how research can achieve impact, foster connections within and beyond institutional environments, and build the overall capacity of the higher education sector to grapple with societal challenges.
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Appendix A

Research Impact Canada’s Evaluation Framework

Logic Model

- **Audiences**
  - Internal RIC (network contributors, governance committee, institutional executive leads)
  - RIC University Partners (faculty researchers, postdocs, students, research networks/courses, governing bodies, staff from RIC units and related units (community engagement, communications, facility, research, knowledge exchange, research services, partnership, social innovation/enterprise, tech transfer/industry liaison, university relations, etc.))
  - Other partners (non-RIC universities, colleges, teaching units, other RIC networks & organizations, NGOs and industry/private sector, government (indigenous, municipal, provincial, federal, health authorities, education, etc.), funding agencies, general public, media)

- **Enabling conditions**
  - Relationships and networks in place on and off campus
  - Organizations have KMB activity located in institutional planning documents
  - There is executive and management support for KMB work
  - (1) Good KMB practice happens: staff have skills & capacity, reengage during staff turnover, KMB-related roles are complementary, role/profile of KMB broker defined, KMB practice is informed by evidence, successful evaluation, with process for decisions based on results
  - Backbone functions in place: data system to capture activities in themensitive, management and funding support, communication systems and protocols in place

- **Activities**
  - Within RIC network
    - Codify methods being used on campus via open access knowledge impact tools (KIT)
    - Build capacity for KMB by sharing tools and I5635
    - Develop and share KMB methods via webinar (professional vs. internal KIT tools)
    - Mentoring for RIC members (1:1 & small group learning, professional vs. KMB) (NIC)
    - Institutional RIC network lead development
    - Conversations (setting up joint projects, e.g., Indigenous, STEM, social enterprise and sustainable, joint projects, e.g., diversity & inclusion)
    - Research impact assessment
    - Manage RIC operations
      - Committees (executive leads, governance, evaluation, professional development, communications)
      - Communications work (website, annual reports, branding/marketing)
      - Membership growth
  - Within RIC partner institutions
    - Member KMB & engagement work may include:
      - Brokering & stewardship of partnerships
      - Support community and public engagement support community partners in internal research process
      - Support grant applications
      - Provide funding for applied research
      - Facilitate access to communication & design resources
      - Develop & share KMB methods
  - Outside RIC
    - Attend national & regional conferences
    - International engagement
    - Federal advocacy
    - RIC Canada brokering

- **Shorter-term outcomes**
  - Within RIC partner institutions
    - More uptake of RIC KMB tools/webinars among campus audiences (e.g., vegetables)
    - Awareness of diversity of KMB tools & practices
    - Knowledge & skills development in KMB
    - Faculty, students, staff gain from ongoing KMB and engagement work
    - Knowledge & skills development in KMB
    - Improved KMB strategies in grant proposals
    - Improved engagement with communities
    - More motivation/knowledge/capacity on KMB scholarship & publication
    - More documentation of community sourced input to effective KMB
    - Community-university networks gain enhanced understanding, skills, capacity for collaboration and KMB practice
    - More use of diverse KMB tools/practices
    - More piloting and testing of KMB tools

- **Longer-term outcomes**
  - At the individual and community level
    - Better KMB practice (skills, capacity)
    - More publication and establishment of KMB scholarship as specialized interdisciplinary field
    - Articulate how KMB intersects with other practices (community engagement, etc.)
  - At the organization level (inside and outside the RIC network)
    - Professionalization of knowledge brokering (roles, job descriptions, career paths)
    - More KMB embedded in curriculum and institutional departments/units
    - More Canadian universities include KMB in strategic plan
    - Executive leads fund KMB sustainably
    - Improved organizational capacity for KMB
    - Development of KMB funds & reward/recognition
    - Better able to capture KMB activities

- **Ultimate goal**
  - Vision
    - A globally leading network which supports researchers, students and their partners to demonstrate the contribution to and impact of research excellence.
Note. Research Impact Canada’s logic model and measurement overview provided general data collection priorities for this study, but they were not a research product of this study. See Bergen (2019) for a description of how these two elements were developed.
Appendix B

Survey Employed in Phase I of Research Impact Canada’s Developmental Evaluation

Section 1: Demographic Questions

Position Within Research Impact Canada

<table>
<thead>
<tr>
<th>Question</th>
<th>Type</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is your name?</td>
<td>Single line text</td>
<td>Open</td>
</tr>
<tr>
<td>2. Please specify your institution and your departmental affiliation</td>
<td>Single line text</td>
<td>Open</td>
</tr>
<tr>
<td>(for example, Queen’s University, Faculty of Education).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. What is your current job title at your institution?</td>
<td>Single line text</td>
<td>Open</td>
</tr>
<tr>
<td>4. How many years have you been working in your current role at your</td>
<td>Scale</td>
<td>• Less than 1 year</td>
</tr>
<tr>
<td>institution?</td>
<td></td>
<td>• 1-3 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4-6 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7-10 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 10+ years</td>
</tr>
<tr>
<td>5. How long have you been connected with Research Impact Canada in a</td>
<td>Numeric</td>
<td>Years and months</td>
</tr>
<tr>
<td>formal membership role? Please specify both years and months.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. How would you describe your role as a member of Research Impact</td>
<td>Multiple select</td>
<td>• Knowledge broker</td>
</tr>
<tr>
<td>Canada? Please select all options that apply.</td>
<td></td>
<td>• Knowledge mobilization support for</td>
</tr>
<tr>
<td></td>
<td></td>
<td>grant applications</td>
</tr>
<tr>
<td>6.1 If “Other,” please explain.</td>
<td></td>
<td>• Community/public engagement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Research communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Librarian/knowledge stewardship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Undergraduate/graduate experiential</td>
</tr>
<tr>
<td></td>
<td></td>
<td>education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Other</td>
</tr>
</tbody>
</table>
7. Were you connected with any members of Research Impact Canada before holding your formal membership role? | Single select | Yes/no
---|---|---
7.1 If yes, how long did the informal work last? Please specify both years and months. | Numeric | Years and months
8. Did you have any training or background in knowledge mobilization (or related concepts like knowledge translation) prior to joining Research Impact Canada? | Single select | Yes/no
8.1 If yes, please specify the training. | Long text | Open
9. Have you taken any training (formal courses or in the form of conferences/workshops) in knowledge mobilization (or related concepts like knowledge translation) since joining Research Impact Canada? | Single select | Yes/no
9.1 If yes, please specify the training. | Long text | Open
10. For each of the following resources, to what extent do you have what you need for your work with Research Impact Canada?
   a. Skills related to knowledge mobilization
   b. Time (specifically the time you are able to engage with the network)
   c. Tools for knowledge mobilization
   d. Support from your institutional leadership | Scale | • Strongly agree
   • Agree
   • Neither agree nor disagree
   • Disagree
   • Strongly Disagree
   • I’m a new member, it’s too soon to tell

Familiarity With Research Impact Canada’s Structure

<table>
<thead>
<tr>
<th>Question</th>
<th>Type</th>
<th>Response Options</th>
</tr>
</thead>
</table>
| 11. How familiar are you with the mandate, mission, and vision of Research Impact Canada? | Scale | • Very familiar
   • Fairly familiar
   • Somewhat familiar
   • Only slightly familiar
   • Not familiar |
| 12. Considering the last 12 months (or less if you are a new member), how familiar are you with the activities of Research Impact Canada? | Scale | • Very familiar
   • Fairly familiar
   • Somewhat familiar
   • Only slightly familiar
   • Not familiar |
13. Considering the last 12 months (or less if you are a new member), how connected do you feel with the membership of Research Impact Canada?  

<table>
<thead>
<tr>
<th>Scale</th>
</tr>
</thead>
</table>
| • Very connected  
| • Fairly connected  
| • Somewhat connected  
| • Only slightly connected  
| • Not connected  

14. Please rank the following functions of Research Impact Canada according to your perspective on priorities for the network.  
   a. Doing research on the science of knowledge mobilization  
   b. Training to develop members’ knowledge mobilization skills  
   c. Sharing knowledge mobilization practices among members  
   d. Informal networking among members  
   e. Being a thought and practice leader in knowledge mobilization in Canada  
   f. International engagement with KMb  

<table>
<thead>
<tr>
<th>Ranking</th>
</tr>
</thead>
</table>
| 1, 2, 3, 4, 5, 6  

**Section 2: Questions Adapted From Michael Smith Foundation for Health Research (2017)**

<table>
<thead>
<tr>
<th>Question</th>
<th>Type</th>
<th>Response Options</th>
</tr>
</thead>
</table>
| 15. The knowledge mobilization topics I have been engaged in with Research Impact Canada:  
   a. Met my expectations  
   b. Were relevant to your current work  
   c. Resulted in learning that you were able to apply  
   d. Were of high quality  

15.1 Please feel free to add additional detail to explain your responses.  

<table>
<thead>
<tr>
<th>Scale</th>
</tr>
</thead>
</table>
| • Strongly agree  
| • Agree  
| • Neither agree nor disagree  
| • Disagree  
| • Strongly Disagree  

16. My participation in Research Impact Canada has led to specific improvements in:  
   a. My awareness of available tools and resources related to knowledge mobilization  

<table>
<thead>
<tr>
<th>Scale</th>
</tr>
</thead>
</table>
| • Strongly agree  
| • Agree  
| • Neither agree nor disagree  
| • Disagree  
| • Strongly Disagree  

220
b. My understanding of knowledge mobilization theory

c. My understanding of knowledge mobilization practices

d. My confidence in enacting knowledge mobilization practices

e. My attitude towards knowledge mobilization

16.1 Please feel free to add additional detail to explain your responses.

17. My participation in Research Impact Canada has led to specific improvements in:

a. The frequency of interactions I have brokered between researchers and research users

b. The types of interactions I have brokered between researchers and research users (e.g., research development interactions, dissemination interactions)

c. The quality of interactions I have brokered between researchers and research users

17.1 Please feel free to add additional detail to explain your responses.

18. What influence (if any) has your membership in Research Impact Canada had on your day-to-day work? Please explain.

19. What influence (if any) has your membership in Research Impact Canada had on your institution? Please explain.

20. What influence do you hope your membership in Research Impact Canada had on your institution in the future?
### Section 3: Questions Adapted From Edelstein (2016)

**Facilitating and constraining factors**

<table>
<thead>
<tr>
<th>Question</th>
<th>Type</th>
<th>Response Options</th>
</tr>
</thead>
</table>
| **21. Trust:** To what extent do you agree with the following statements about your interactions with the Research Impact Canada membership? | Scale | • Strongly agree  
• Agree  
• Neither agree nor disagree  
• Disagree  
• Strongly Disagree  
• I’m a new member, it’s too soon to tell |
| a. Members act in ways that benefit the network as a whole               |       |                                                                                  |
| b. Members contribute information of relevance to the network and to network members |       |                                                                                  |
| c. The leadership fosters a culture of trust in the network              |       |                                                                                  |
| d. My time and energy are well spent due to trust among the membership  |       |                                                                                  |
| e. Members fulfil their obligations to the network                       |       |                                                                                  |
| **22. Leadership:** To what extent do you agree that the formal leadership of Research Impact Canada effectively performs the following functions? | Scale | • Strongly agree  
• Agree  
• Neither agree nor disagree  
• Disagree  
• Strongly Disagree  
• I’m a new member, it’s too soon to tell |
| a. Takes responsibility for managing the network                         |       |                                                                                  |
| b. Communicates the vision                                               |       |                                                                                  |
| c. Works to develop common goals                                         |       |                                                                                  |
| d. Evaluates the progress of the network                                 |       |                                                                                  |
| e. Keeps the work on track                                               |       |                                                                                  |
| f. Provides orientation to new members when they join                    |       |                                                                                  |
| g. Promotes co-learning between members                                  |       |                                                                                  |
| **23. Communication:** To what extent do you agree that the communication tools used in Research Impact Canada are effective for the following objectives? | Scale | • Strongly agree  
• Agree  
• Neither agree nor disagree  
• Disagree  
• Strongly Disagree  
• I’m a new member, it’s too soon to tell |
| a. Maintaining formal contact with members                               |       |                                                                                  |
| b. Maintaining informal contact with members                             |       |                                                                                  |
| c. Organizing network activities (e.g., meetings)                        |       |                                                                                  |
| d. Distributing materials that inform members to make timely decisions   |       |                                                                                  |
24. **Communication**: How often does formal communication between members occur (i.e., e-mails to members; reports updating members on network activities)?

25. How often should formal communication between members occur (i.e., e-mails to members; reports updating members on network activities)?

<table>
<thead>
<tr>
<th>Single select</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every day</td>
</tr>
<tr>
<td>Every week</td>
</tr>
<tr>
<td>A few times a month</td>
</tr>
<tr>
<td>About once a month</td>
</tr>
<tr>
<td>About once a quarter</td>
</tr>
<tr>
<td>Once a year or less</td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>I’m a new member, it’s too soon to tell</td>
</tr>
</tbody>
</table>

26. **Resources**: For each of the following types of resources, to what extent does Research Impact Canada have what it needs to work effectively?

<table>
<thead>
<tr>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of what it needs</td>
</tr>
<tr>
<td>Some of what it needs</td>
</tr>
<tr>
<td>Little of what it needs</td>
</tr>
<tr>
<td>None or almost none of what it needs</td>
</tr>
<tr>
<td>Uncertain</td>
</tr>
<tr>
<td>I’m a new member, it’s too soon to tell</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Type</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. Thinking about the membership of Research Impact Canada, how well does the network: a. Align its activities with the memberships’ needs</td>
<td>Scale</td>
<td>Extremely well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fairly well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Somewhat well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not well</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I’m a new member, it’s too soon to tell</td>
</tr>
<tr>
<td>b. Work together to address the needs of its target audiences (e.g., researchers)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Work to match the goals of the different institutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Minimize the barriers to being involved in the network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Recognize the value of each member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Type</td>
<td>Response Options</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>f. Engage all members in network activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Include members in decision-making processes to move the network forward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Do members have opportunities to develop the necessary relationships to participate in Research Impact Canada activities? Please explain.</td>
<td>Long text</td>
<td>• Open</td>
</tr>
<tr>
<td>29. Please explain the typical nature of your interactions with other Research Impact Canada members.</td>
<td>Long text</td>
<td>• Open</td>
</tr>
</tbody>
</table>

**Impact on Professional Practice**

<table>
<thead>
<tr>
<th>Question</th>
<th>Type</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. Within the past 12 months, how well has Research Impact Canada:</td>
<td>Scale</td>
<td>• Extremely well&lt;br&gt;• Fairly well&lt;br&gt;• Somewhat well&lt;br&gt;• Not well&lt;br&gt;• Uncertain&lt;br&gt;• I’m a new member, it’s too soon to tell</td>
</tr>
<tr>
<td>a. Provided professional development opportunities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Enhanced the importance of knowledge mobilization practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Increased the body of knowledge you have for making informed decisions about knowledge mobilization practices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Used information and materials provided by the membership for decision-making purposes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Generated increased learning opportunities related to knowledge mobilization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Enhanced the potential for greater impact from your work with target audiences (e.g., researchers and research users)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Helped your institution bridge the gap between research, policy, and practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. How have the benefits of participating in Research Impact Canada compared to the costs?</td>
<td>Single select</td>
<td>• Benefits greatly exceed costs&lt;br&gt;• Benefits exceed costs&lt;br&gt;• Benefits and costs are equal&lt;br&gt;• Drawbacks exceed the benefits&lt;br&gt;• Drawbacks greatly exceed the benefits&lt;br&gt;• I’m a new member, it’s too soon to tell</td>
</tr>
<tr>
<td>31.1 Please explain your answer from the previous question.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Response Type</td>
<td>Options</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>32. Within the past 12 months, what were some strengths of being a member of Research Impact Canada?</td>
<td>Long text</td>
<td>Open</td>
</tr>
<tr>
<td>33. Within the past 12 months, what were some challenges of being a member of Research Impact Canada? What would you recommend to remedy these challenges?</td>
<td>Long text</td>
<td>Open</td>
</tr>
<tr>
<td>34. To what extent do you agree or disagree with the following statement: Membership in Research Impact Canada has positively influenced my knowledge mobilization practice.</td>
<td>Single select</td>
<td>Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree, I’m a new member, it’s too soon to tell</td>
</tr>
</tbody>
</table>
Appendix C

Interview Protocol Employed in Phase II of Research Impact Canada’s Developmental Evaluation

CONTEXTUAL BACKDROP AND THE INSTITUTIONAL LEVEL

1. What is your job title? To whom do you report? Ultimately, which Vice President is your unit associated with?
2. What are your primary job functions?
3. How long have you been involved with Research Impact Canada (RIC)?
4. What does “knowledge mobilization” mean for you? Do you prefer a different term to describe your work?
5. What does “research impact” mean for you?

CONTEXTUAL BACKDROP AND THE NETWORK LEVEL

6. How could we enhance contact and learning between RIC members?
7. How could RIC improve new member orientation?
8. In Phase 1, time was identified as the primary limitation for RIC members. What strategies have you used to manage time limitations?
9. What do you think would be feasible and useful way for sharing KMb tools and resources among RIC members?

USEFULNESS

10. What KMb resources from RIC have you found most useful? Why?
11. What kinds of information would improve the usefulness of RIC’s activities to build KMb capacity?
12. What kinds of collaboration with other RIC members would be useful for your KMb work?
13. Following from Phase 1 findings, RIC is considering developing practice based sub-groups to connect members with similar functions (e.g., public engagement). What do you think of this idea, and what would you want to see from these groups?

**USE**

**Exploring the main KMb activities and thinking used by RIC participants**

14. What are the main KMb activities/approaches/strategies you use? Can you provide some examples of successes? Can you provide some examples of challenges? What (if any) models, theories or frameworks have been used in your KMb work?

15. What factors are driving your institutions activities/approaches/strategies to KMb? Are there any gaps in KMb that you think need to be developed at your institution? Are there other who perform KMb-related activities within your institution?

16. Has your institution always used these or similar approaches or has there been a change in direction in the last few years?
   a. *If there has been a change:* What has been the influence (if any) of RIC on those changes?

17. Does your institution have future plans for KMb that vary from current practice?

**Exploring the ‘target’ audience/users**

18. Which groups or individuals are the main focus of your KMb activities? Of your institution’s KMb activities?

19. Are external partners involved in your KMb activities? In your institution’s KMb activities?

**Exploring formative learning and practical experience**

20. What key takeaways for KMb have you realized throughout your experiences?

21. What advice/tips would you give to a colleague just getting started in a similar role?

22. How could this evaluation support your institution and RIC?
   a. *What questions seem to come up repeatedly in your conversations about KMb with others in your institution?*
   b. *What KMb activities do people seem most animated about?*
c. What are you really curious about?

23. Is there anything else you would like us to know?
Appendix D

Overview Charting Form

<table>
<thead>
<tr>
<th>Extraction Category</th>
<th>Collected Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Publication Information</td>
<td></td>
</tr>
<tr>
<td>a. Citation: (Author, Year)</td>
<td></td>
</tr>
<tr>
<td>b. Sector</td>
<td></td>
</tr>
<tr>
<td>c. Number of instruments and measures included in the review</td>
<td></td>
</tr>
<tr>
<td>d. Number with relevance for measuring impact</td>
<td></td>
</tr>
<tr>
<td>2. Contexts of Use</td>
<td></td>
</tr>
<tr>
<td>a. Geographic origin of the instruments or measures</td>
<td></td>
</tr>
<tr>
<td>b. Primary target population(s) (e.g., researchers, teachers)</td>
<td></td>
</tr>
<tr>
<td>c. Response type(s) of the instruments and measures</td>
<td></td>
</tr>
<tr>
<td>3. Constructs and Content</td>
<td></td>
</tr>
<tr>
<td>a. Main construct and definition or description</td>
<td></td>
</tr>
<tr>
<td>b. Link between construct and content themes (i.e., theoretical basis)</td>
<td></td>
</tr>
<tr>
<td>c. Content themes of the instruments and measures</td>
<td></td>
</tr>
<tr>
<td>4. Psychometric and Pragmatic Qualities</td>
<td>(only tools with relevance for measuring impact)</td>
</tr>
<tr>
<td>a. Number of tools</td>
<td></td>
</tr>
<tr>
<td>b. Validity evidence:</td>
<td></td>
</tr>
<tr>
<td>i. Total # that provided such evidence</td>
<td></td>
</tr>
<tr>
<td>ii. Sources of validity evidence</td>
<td></td>
</tr>
<tr>
<td>c. Reliability evidence:</td>
<td></td>
</tr>
<tr>
<td>i. Total # that provided such evidence</td>
<td></td>
</tr>
<tr>
<td>ii. Sources of reliability evidence</td>
<td></td>
</tr>
<tr>
<td>d. Other sources of psychometric evidence</td>
<td></td>
</tr>
<tr>
<td>e. Pragmatic evidence</td>
<td></td>
</tr>
<tr>
<td>5. Recommendations</td>
<td></td>
</tr>
<tr>
<td>a. Instruments and measures recommended by review authors</td>
<td></td>
</tr>
<tr>
<td>b. If no recommendations are made, note any instruments and measures that are outstanding based on psychometric and pragmatic qualities?</td>
<td></td>
</tr>
</tbody>
</table>
Appendix E

General Research Ethics Board Approval (Chapters 2, 3, and 4)

February 28, 2019

Dr. Amanda Cooper
Associate Professor
Faculty of Education
Queen’s University
Duncan McArthur Hall, A217
511 Union Street West
Kingston, ON, K7L 3N7

GREB Ref #: GEDUC-944-19; TRAQ # 6026023
Title: "GEDUC-944-19 Knowledge Mobilization in Canadian Universities: Exploring Research Impact with Non-Academic Partners"

Dear Dr. Cooper:

The General Research Ethics Board (GREB), by means of a delegated board review, has cleared your proposal entitled "GEDUC-944-19 Knowledge Mobilization in Canadian Universities: Exploring Research Impact with Non-Academic Partners" for ethical compliance with the Tri-Council Guidelines (TCPS 2 (2014)) and Queen’s ethics policies. In accordance with the Tri-Council Guidelines (Article 6.14) and Standard Operating Procedures (405.001), your project has been cleared for one year. You are reminded of your obligation to submit an annual renewal form prior to the annual renewal due date (access this form at http://www.queens.ca/traq/signon.html; click on "Events;" under "Create New Event" click on "General Research Ethics Board Annual Renewal/Closure Form for Cleared Studies"). Please note that when your research project is completed, you need to submit an Annual Renewal/Closure Form in Rome/iraq indicating that the project is "completed" so that the file can be closed. This should be submitted at the time of completion; there is no need to wait until the annual renewal due date.

You are reminded of your obligation to advise the GREB of any adverse event(s) that occur during this one-year period (access this form at http://www.queens.ca/traq/signon.html; click on "Events;" under "Create New Event" click on "General Research Ethics Board Adverse Event Form"). An adverse event includes, but is not limited to, a complaint, a change or unexpected event that alters the level of risk for the researcher or participants or situation that requires a substantial change in approach to a participant(s). You are also advised that all adverse events must be reported to the GREB within 48 hours.

You are also reminded that all changes that might affect human participants must be cleared by the GREB. For example, you must report changes to the level of risk, applicant characteristics, and implementation of new procedures. To submit an amendment form, access the application by at http://www.queens.ca/traq/signon.html; click on "Events;" under "Create New Event" click on "General Research Ethics Board Request for the Amendment of Approved Studies." Once submitted, these changes will automatically be sent to the Ethics Coordinator, Mr. Gal Irving, at University Research Services for further review and clearance by the GREB or Chair, GREB.

On behalf of the General Research Ethics Board, I wish you continued success in your research.

Sincerely,

Dean Tripp, Ph.D.
Chair
General Research Ethics Board

c: Mr. Stephen MacGregor, Research Assistant
Dr. Pamela Beach, Chair, Unit REB
Mrs. Erin Resse, Dept. Admin.