

Knowledge Mobilization in a College Context:  
Constructing Meaning in Applied Research Communication

by

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### Abstract

Knowledge mobilization (KMb) is the communication process by which researchers engage with stakeholders to produce, co-produce, and share knowledge. The question of how researchers can better mobilize knowledge at each stage of the research process has become a matter of acute public and academic interest. Yet existing research indicates that researchers are often reticent to engage with non-academic stakeholders; studies have found many do not have the necessary time, skills, or resources. Furthermore, most research on KMb has focused on large institutions or a university context, despite the fact that Canada's colleges also produce a significant proportion of Canadian research.

This study investigated college researchers' understandings of and approaches to KMb using in-depth, semi-structured interviews. Eleven participants representing six Canadian community colleges and polytechnic institutes were interviewed about their approaches to KMb and the institutional or systemic factors that influence how they perceive KMb and carry out KMb activities. Participants defined KMb as a complex, reciprocal process with the potential to elevate their field, solve problems, and inform important decisions. Key KMb facilitators identified by the participants included low professional pressure to publish academically, which freed up time and resources for non-traditional approaches to KMb; funding structures that incentivize effective and ongoing KMb; and strong collaborations with other college departments, especially communications and marketing. Barriers included challenges to academic freedom, long delays caused by institutional and legal oversight of KMb, and certain gaps in funding opportunities.

*Key words:* knowledge mobilization, research communication, co-creation, social construction

## **Preface**

This thesis is an original work by Taylor Merkley Doyer. No part of this thesis has been previously published. This research received ethics approval from the University of Alberta Research Ethics Board, Project Name “Knowledge Mobilization in a College Context: Constructing Meaning in Applied College Research,” No. Pro00105204, March 9, 2021.

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## Introduction

Academic researchers have often been criticized for being aloof and out of touch with “the real world” (Baron, 2010; Wilkinson & Weitkamp, 2016). There is a growing conviction among Canadian funders, institutions, and publics that research should be accessible beyond the academic sphere. Researchers are also embracing this perspective, as Carleton University (2014) notes: “In general, researchers want to do research that has value and impact” (para. 1). At the same time, there has also been a growing awareness that the research process can be strengthened through dialogue with stakeholders outside of academic circles, and that including practitioner and other non-academic perspectives can provide valuable insight into research direction, design, and application (Burke & Heynen, 2014; Carolan, 2008).

The question of how researchers can mobilize research knowledge has thus become a matter of acute public and academic interest. Yet researchers sometimes struggle to engage with non-academic audiences (Wilkinson & Weitkamp, 2016); some report that they do not have the necessary time or resources, and others perceive the task as too difficult or risky to attempt (Davies, 2008). Furthermore, most research on this topic has focused on a large university context, despite the fact that colleges also produce a significant proportion of Canadian research. Unlike universities, colleges often have specific mandates to conduct research that is integrated with local industry and community (Hogan & Trotter, 2013), making effective communication with non-academic stakeholders especially crucial to research success.

The term *knowledge mobilization* (KMb) is commonly used to describe the process by which researchers engage in dialogue with publics or other information users about their research, and the term is used especially often in the humanities and social sciences. Gaudet (2013) defines KMb as “the use of justified beliefs (knowledge)...towards the achievement of

goals (social, cultural, political, professional and economic)” (p. 175). KMb is therefore not an activity undertaken for its own sake; it is oriented around achieving research outcomes. This should be unsurprising considering that research is usually funded by a limited public purse, and calls for accountability in the form of actionable research outputs have been mounting in recent years (Gaudet, 2013). In alignment with the current academic consensus, this thesis adopts a view of knowledge as relational, negotiated, and constructed rather than an objective or discoverable phenomenon (Cherlet, 2014). Although the growing academic interest in KMb has resulted in a large volume of literature on its function, purpose, and applications (e.g., Cooper et al., 2018; Phipps et al., 2012; Phipps & Shapson, 2009; Powell et al., 2017; Simis et al., 2016), little is known about how KMb occurs in a Canadian college context. To address this gap, the current research investigates researchers’ understandings of and approaches to KMb at Canadian colleges using a qualitative design and in-depth, semi-structured interviews. This research asks the following questions: *How do college researchers define and understand KMb?* and *What are the main **barriers** and **facilitators** to effective KMb in the college context?*

Two opposing concepts are of critical importance to this thesis: *the deficit model* of KMb versus *knowledge democratization* in KMb. These concepts illustrate an important question in contemporary KMb scholarship: who should be included in research, and when? Are some types of knowledge more valuable than others? The deficit model of KMb assumes that researchers hold privileged knowledge and that the primary function of KMb is for researchers to communicate with “knowledge users” in a unidirectional knowledge transfer (Wilkinson & Weitkamp, 2016). However, this thesis will argue instead for the *knowledge democratization* perspective: that is, knowledge produced by researchers should not be uncritically privileged above all other knowledge types, and a range of perspectives should be included in research



dialogues (Burke & Heynen, 2014; Carolan, 2008; Unger et al., 2020). The literature review will also reveal key insights about how researchers perceive KMB (Davies, 2008; Simis et al., 2016), which tactics and approaches to KMB appear to yield strong results (Bennet & Bennet, 2007; Phipps & Shapson, 2009), and what KMB barriers and facilitators are faced by researchers in the Canadian university research environment (Phipps et al., 2012; Cooper et al., 2018).

The qualitative methodology used in this thesis is closely aligned with the social constructionist perspective of knowledge (Leeds-Hurwitz, 2009). To investigate my research questions, I conducted semi-structured interviews with 11 researchers representing six Canadian colleges. I also involved participants in the analysis process by inviting them to review and edit their interview summaries and transcripts, encouraging knowledge co-creation. I applied an inductive coding strategy, allowing themes and codes to emerge during the analysis process rather than using pre-constructed coding categories. This qualitative approach cannot provide statistical comparisons between demographic groups, nor can it describe the prevalence or frequency of particular phenomena; rather, its strength is in richly describing subjective individual experiences.

In this thesis, I will first offer context on the research environment at colleges in Canada, operationally define key terms, and establish the epistemological approach of this thesis toward knowledge and knowing. The literature review will then provide an overview of academic discourse on the deficit model and knowledge democratization perspectives, as well as on researcher perspectives and beliefs about KMB and the experiences of researchers at Canadian universities and large research institutions. After an explanation of the methodological approach, I will then offer a narrative-style summary of the findings and a detailed discussion of key insights, as well as recommendations for future research.

## **Background**

This section will offer background information to help contextualize the current research. First, I will establish my own positionality in relation to the research topic, including my personal interest in this thesis and my basic epistemological assumptions. I will also provide a high-level overview of applied research environments at Canadian colleges and their key points of departure from one another and from university research environments. Finally, I will lay the theoretical groundwork for the nature of knowledge and knowing, introducing some contemporary perspectives on KMb's relationship to current communication theories and paradigms.

### **Researcher Positionality**

In qualitative research, positionality is the idea that research is a shared experience between the participants and the researcher, and that the researcher's identity, perspectives, and experiences inevitably influence the research process (Bourke, 2014). Qualitative researchers tend to accept and even embrace some level of subjectivity in research (Merrigan et al., 2012), so an acknowledgement of one's positionality is sometimes viewed as a strength of the qualitative approach (Bourke, 2014). My own positionality is therefore an important consideration in this thesis.

My interest in this research comes in part from my professional experiences. As a research facilitator at a comprehensive community college in northwestern Alberta, I support and develop institutional applied research programs for my institution. The researchers with whom I work frequently demonstrate exceptional skill and ability in KMb, but even the most experienced researchers occasionally struggle with KMb for reasons related to insufficient time or funding, lack of skill or training, and perceived risks to career or reputation. Many of the most commonly

deployed KMb strategies, such as conference presentations and academic articles, appear to be ineffective at accomplishing researchers' more practical KMb goals. Effective KMb is paramount to ensuring that an institution's research programming is useful, impactful and sustainable, and that public investment in research yields meaningful returns. I therefore see the current research as an opportunity to explore how colleges can best support researchers in achieving KMb success.

Another component of my positionality is my epistemological perspective. In alignment with much of the current literature on the nature of knowledge and knowing, I subscribe to the social constructionist worldview that human knowledge is not an objective, discoverable phenomenon, but rather that it is negotiated, subjective, and co-created (Cherlet, 2014; Gaudet, 2013; Leeds-Hurwitz, 2009). According to this perspective, research knowledge is not generated by the researcher alone, but is created through interaction with participants, stakeholders, collaborators, and other participants in the dialogue (Burke & Heynen, 2014; Léhebel-Péron et al., 2016; Nilsen, 2015). This informs both my choice in methodology (qualitative interviews, co-constructive interpretation, and thematic analysis), and my preconceptions about the research topic itself (i.e., a predisposition toward co-creative narratives of KMb).

### **Research at Canadian Colleges**

Colleges make unique and valuable contributions to the Canadian research ecosystem. To understand these contributions, it is useful to consider the roles that colleges have played in Canadian post-secondary education systems since their formal introduction, which occurred in the 1960s for most provinces and territories (Hogan & Trotter, 2013). There are a range of non-university post-secondary institution types in Canada, including community colleges, polytechnic institutions, and the Québec system of CÉGEPs, which offer combined high school

and college credit (Les CÉGEPS du Québec, 2019). Community colleges and polytechnic institutions are the two institution types represented in the current research, and although they are frequently discussed as though they are part of the same homogeneous non-university system, important distinctions exist between them. One key difference is the polytechnic's focus on applied technology, experiential learning, and vocational training; they also do not typically share community colleges' focus on transferability to university in more traditional disciplines such as English or pure mathematics (Doern, 2008; Trotter & Mitchell, 2018). Despite these differences, many entities and organizations such as Colleges and Institutes Canada (CICan) and the Tri-Council funding agencies frequently use "colleges" as a shorthand for all non-university institution types. In this thesis, I will adhere to this tradition and use "colleges" as an umbrella term while recognizing that it encompasses a range of diverse institutions.

Canada's colleges do not share a common governance structure with universities, and have historically served different mandates. When Canadian colleges were first established in the 1960s, they were managed much more like businesses than their university counterparts, with a managerial structure and close alignment with local industry needs (Hogan & Trotter, 2013). Colleges tend to approach research from what Furedi (2004) pejoratively calls the new "instrumentalist ethos," the idea that research has value primarily as a mechanism for economic growth instead of for its own sake (p. 3). Although Furedi and others are critical of the instrumentalist ethos, others argue that this type of research fills a role not always adequately addressed by universities or other academic entities (Association of Canadian Community Colleges, 2011; Doern, 2008). Universities and colleges are grounded in different philosophical approaches to education; when they first began to emerge, "[c]olleges and institutes were seen as a vehicle for technical education (*techne*) and not the Aristotelian education (*episteme*) offered in

universities” (Hogan & Trotter, p. 73). These different approaches track a distinction in the nature and purpose of research outputs from the two institution types, outputs that are not redundant and do not compete, but instead complement one another. The line between these two research types is also frequently blurred: it is easy to find examples of instrumentalist research at universities as well as “pure” or basic research conducted at colleges. College research should not be considered synonymous with instrumentalism and Canadian universities are in fact increasingly branching out toward “use-inspired” and “applied” forms of research (Veletanlić, 2020).

In fact, there is some evidence that Canadian post-secondary systems are currently experiencing an “academic drift” that blurs the lines between university and non-university institution types (Doern, 2008; Trotter & Mitchell, 2018). This is in part because provincial governments increasingly view post-secondary systems as a tool for economic development rather than higher education for its own sake (Trotter & Mitchell, 2018). Universities across Canada are therefore experiencing increasing pressure to create programming and research outputs that directly support labour market needs, and colleges are increasingly offering four-year degrees and producing the kind of basic research that had previously been the exclusive domain of universities (Doern, 2008). Although provincial governments have attempted to maintain the distinction by focusing college mandates on technical and applied rather than scientific or basic research, there is a natural tendency among college faculty toward the traditional university-style basic research that characterized their own post-secondary training, diluting the industry-engaged model of research that colleges were initially intended to fulfill (Trotter & Mitchell, 2018). Trotter and Mitchell argue that this trend may jeopardize the unique value contributed by non-university institutions. In a “worst-case outcome,” colleges risk

becoming merely “second tier” universities, and the applied research niche they once occupied would be lost entirely (p. 95).

College research mandates maintain a heavy emphasis on technology development, commercialization, prototype development and testing, and industry integration. Examples include Technology Access Centres (TACs), the network of industry-integrated college research facilities funded by Tech-Access Canada under the College and Community Innovation (CCI) program. TACs are specialized research centres staffed and operated by Canadian colleges. They undertake applied research in close partnership with local industry and serve the research needs of small and medium sized enterprises (SMEs) in their geographical regions. As the name implies, a key value proposition of the TACs is their ability to provide industry with access to specialized technology, equipment, expertise, and other resources that can elevate their business and contribute to economic development (Tech-Access Canada, 2020). TACs frequently undertake applied research projects and perform other research services for their industry partners, often in a fee-for-service relationship. At the time of writing there are 60 TACs operating across Canada in a variety of specialized fields; for example, the Green Building Technologies TAC from the Southern Alberta Institute of Technology (SAIT) focuses on applied research in sustainable construction, and Sheridan College’s Screen Industries Research and Training Centre supports innovation in film and animation (Tech-Access Canada, 2020). Most TACs are expected to support technology commercialization as part of their mandate (Tech-Access Canada, 2020).

College research does not take place exclusively in the private sector. Social innovation research, wherein colleges collaborate with non-profit and public sector partners to address complex social issues, also continues to occupy an important role at Canadian colleges. Colleges

and Institutes Canada's (2018) most recent applied research survey showed that Canadian colleges reported engaging in 534 social innovation projects in 2017–2018, making social innovation the third most popular research category behind manufacturing and digital technologies. Twelve per cent of the organizations who partnered with colleges on applied research in that year were from the non-profit sector (para. 6). One of the CCI program's nine funding streams is the Social Innovation Fund (SIF), which "foster[s] community innovation by connecting the talent, facilities and capabilities of Canada's colleges and polytechnics with the research needs of local community organizations" (NSERC 2020c, para. 8) and requires colleges to undertake research that directly responds to a community need. In 2020, 53 SIF grants were awarded to Canadian colleges to undertake social innovation research (NSERC, 2020a). SIF-funded projects included a study by Grande Prairie Regional College which investigated community police responses to mental health emergencies (Korpan & Yeung, 2021), as well as a Bow Valley College initiative to "inform the development of practical tools" for college-based social innovation (Wilde et al., 2018). Although less prevalent than industry-integrated research, social innovation plays a prominent role in the college research ecosystem.

### **Key Definitions**

I will here briefly define two key terms that appear in this thesis: knowledge mobilization and stakeholders. Firstly, as is the case with most abstract terms, definitions of knowledge mobilization (KMb) vary widely. Some definitions focus on the flow of knowledge from researcher to knowledge user; for example, Carleton University (2014) defines KMb as "all activities and products created that help your research be useful and used" (para. 2). Similarly, the University of Ottawa (n.d.) defines KMb as "promoting and facilitating the use of research among knowledge users...to help them make informed decisions about policies, programs,

practices and behaviour” (para. 1). Other definitions construct KMb as more networked and multidirectional; the Social Sciences and Humanities Research Council of Canada (SSHRC, 2019a) defines KMb as “the reciprocal and complementary flow and uptake of research knowledge between researchers, knowledge brokers and knowledge users...” There is widespread acknowledgement among research institutions that KMb, like knowledge itself, is non-linear, co-created, and interpretive (Powell et al., 2017).

While “knowledge mobilization” has become a popular term in Canadian research institutions and funding bodies, terms such as *knowledge translation*, *knowledge transfer*, and *dissemination* also appear frequently in the literature. “Knowledge translation” is the term most preferred in the medical sciences field, defined by the Canadian Institutes of Health Research (2019) as “a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system” (para. 1). Greenhalgh and Wieringa (2011) problematize the term “knowledge translation” and similar terms like “knowledge transfer” because these expressions rely on flawed assumptions about knowledge: i.e., that it is objective, fixed, and can exist independent of context and interpretation. In this thesis, I will use the term knowledge mobilization and its abbreviation, KMb, rather than its alternatives to describe the phenomenon of research communication between researchers and their diverse stakeholders.

It is also important to understand what is meant by “stakeholders,” as this term is used throughout this thesis to describe participants in research dialogues. In business and in evaluation science, “stakeholder” is often used as an umbrella term to describe all those who hold an interest, direct or indirect, in the outcome of a venture or initiative (Patton, 2008). The term



“stakeholders” is often used in the literature on KMB to refer to all groups, entities, and individuals who are affected by the research outcomes and therefore have a “stake” or vested interest in the project (e.g. Greenhalgh & Wieringa, 2011; Phipps et al., 2012). Stakeholders may or may not be direct participants in the research and can include research partners and collaborators, the media, industry practitioners, government, and general publics. Stakeholders and researchers are also not mutually exclusive groups; these roles are fluid and frequently overlap. The porous boundary between researcher and stakeholder mean that one should avoid considering them in terms of a strict binary (Phipps et al., 2012). With this caveat in mind, I will defer to the most common use of “stakeholder” in the literature, which is to describe the person or group toward whom researchers’ KMB efforts are targeted and with whom researchers engage in an ongoing dialogue about the research (Patton, 2008).

### **Theoretical Context**

The nature of knowledge has been a topic of philosophical interest since at least the time of Aristotle (Greenhalgh & Wieringa, 2011). Until relatively recently, knowledge in the age of modernism was often conceptualized as a neutral, value-free commodity that can easily shift between contexts while retaining its essential, unchanging meaning (Cherlet, 2014; Greenhalgh & Wieringa, 2011). This perspective informs the *deficit model* of research communication (Baron, 2010), which assumes that “communication follows a straightforward and linear process, whereby the main problem to be solved is public ignorance of scientific issues” (Wilkinson & Weitkamp, 2016, p. 4). Although the deficit model has largely fallen out of favour with communication scholars, it persists in the public discourse, including among many researchers’ conscious and unconscious attitudes and beliefs (Cherlet, 2014; Davies, 2008; Simis et al., 2016). Proponents of the deficit model assume KMB is a straightforward process whereby knowledge

holders (i.e. researchers) alleviate the knowledge deficit of their audiences through a unidirectional transfer of information, not considering the subjective and interpretive processes that accompany this type of interaction (Wilkinson & Weitkamp, 2016). Adherence to the deficit model is often accompanied by the presumption that scientific knowledge or research knowledge is superior to all other knowledge types, including non-scientific knowledge held by laypersons and practitioners (Burke & Heynen, 2014; Léhebel-Péron et al., 2016).

The deficit model has its roots in the *transmission model* of human communication. Developed by Shannon and Weaver (1949) to explain concepts related to electronic communications, the transmission model has been used to describe human-to-human communication, presuming that the same principles that guide the communication of telegraphy and radio signals can describe human interactions as well (Bowman & Targowski, 1987). According to the transmission model, communication in its simplest form consists of a message, sender, and receiver. The message, an information “packet” unaffected by social or cultural context, travels from sender to receiver via a communication channel. In the absence of “noise” or interference, the information will reach the receiver in its intended form. Although the transmission model of communication continues to be used in computing science and telecommunications (e.g. Al-Fedaghi, 2012), it has largely been discarded as a tool for understanding human communication, as it neglects to consider the complex interpretive processes that accompany our interactions (Cherlet, 2014). Even by the 1980s, the transmission model of communication was falling out of favour with communication scholars for its oversimplicity and its tendency to neglect social context (Bowman & Targowski, 1987). The transmission model informs the deficit model; both presume knowledge can be transferred from

knowledge holder (sender) to knowledge user (receiver) and will be interpreted identically by both parties assuming the absence of interference (Baron, 2010; Wilkinson & Weitkamp, 2016).

Knowledge is now widely understood among epistemologists to be a relational, negotiated phenomenon that depends upon sociocultural context and subjective interpretation (Burke & Heynen, 2014; Cherlet, 2014; Gaudet, 2013; Powell et al., 2017). Social construction is the communication theory first forwarded by Berger and Luckman to explain knowledge construction and communication as the product of social interaction rather than as part of objective reality (Leeds-Hurwitz, 2009). The primary assumption of social construction is that “meanings are developed in coordination with others rather than separately within each individual or in the world of things” (Leeds-Hurwitz, p. 891). According to social construction, researchers cannot meet the threshold of objectivity or neutrality, as they invariably use interpretive processes and subjective value judgements to select research topics, establish study parameters, and interpret results. As Greenhalgh and Wieringa (2011) argue, research priorities do not emerge in a vacuum, but are often set and funded by large, powerful entities (in Canada, often by the federal Tri-Council funding agencies), which collectively decide which topics are worthy of exploration, who can engage in research, and which outcomes are desirable. Although researchers may prefer to think of themselves as objective pursuers of truth, contemporary thought on the nature of knowledge and knowing casts doubt on this possibility, since all research knowledge must pass through the prism of individuals’ subjective interpretations and experiences.

I here align myself with the current academic consensus in rejecting the deficit model of research communication. Its shortcomings go beyond its failure to accurately reflect the communication process: frequently, it also results in poor outcomes for researchers who seek to

engage in meaningful dialogue with stakeholders. At best, overreliance on the deficit model can result in KMb activities that are one-sided and not meaningfully tailored to key stakeholders, resulting in a lack of “cognitive diversity” that can slow research progress and uptake (Burke & Heynen, 2014). At worst, deficit model thinking can serve to alienate researchers from their publics, undermine public confidence in research, and lead researchers to miss or disregard vital non-academic perspectives (Wilkinson & Weitkamp, 2016). Instead, this thesis embraces an understanding of research communication as a dynamic, iterative, multidimensional process: a “collaborative entanglement” of researchers and non-researchers alike (Bennet & Bennet, 2007, p. 48).

In this section, I have explored contextual factors relevant to the current research, including an overview of my positionality as researcher, an introduction to college-based research, and some broad perspectives on the nature of knowledge, knowing, and knowledge mobilization. With this context established, the next chapter will explore key literature that has influenced this thesis.

### **Literature Review**

This chapter presents a limited review of the literature on knowledge mobilization and research communication, especially within a post-secondary research context. It begins with an introduction to the concept of knowledge democratization, the idea of including non-researcher perspectives as valued voices in research discourse. It will then explore researchers’ beliefs about and attitudes toward KMb and attempt to explain the persistence of the deficit model in research communication practice, even as it has largely vanished from KMb theory. Finally, it will highlight some of the institutional barriers to KMb that have been identified at Canadian universities, as well as what facilitators, tools and tactics may support KMb success. In

alignment with my research questions, I have chosen to focus this review on the perspectives of researchers rather than their various stakeholders. Examination of the literature will reveal certain knowledge gaps this thesis aims to fill. Particularly, it will shed light on the lack of research on how KMB functions in Canadian colleges, which, as we have seen, offer a unique applied research landscape.

### **Knowledge Democratization**

The “knowledge” in knowledge mobilization is frequently assumed to refer to *research knowledge* or scientific knowledge. Most often, this refers to knowledge that is produced by credentialed academics using the scientific method. Unger et al. (2020) state that scientific knowledge is an attempt “to explain natural or social phenomena” and is established by developing and testing scientific theories (p. 5). Research knowledge occupies a privileged place in the culture, with researchers generally esteemed above—and often at the expense of—other knowledge holders: “Scientific expertise, like all forms of expertise, is established largely through the delegitimation of other ways of knowing and other knowers” (Burke & Heynen, 2014, p. 10). Critics argue that this leads researchers to hold a “near monopoly on knowledge” (Burke & Heynen, p. 12). Burke and Heynen refer to knowledge hierarchies when describing this phenomenon, and argue that these hierarchies serve only to reinforce dominant power structures and marginalize certain knowledge types.

A range of non-research knowledge types can also hold value in research discourses, especially when considered in concert with academic research. For example, Nilsen (2015) explores the role of “common sense” in research, defined as “a group’s shared tacit knowledge concerning a phenomenon” (p. 9) and argues that this type of knowledge should be considered a valuable complement to research knowledge. Unger et al. (2020) describes how medical research

has often disregarded the perspectives of non-academic medical professionals, who hold what the authors term *professional knowledge*, or “knowledge that identifies how the subject of study can and ought to be improved under every day conditions” (p. 2). The authors argues that professional and scientific perspectives are “mutually enriching” and together may produce stronger, more usable research (p. 5). Finally, Léhebel-Péron et al. (2016) explored the role of *traditional ecological knowledge*, or “the knowledge, beliefs, traditions, practices, institutions, and visions of the world that are elaborated by local communities as the result of their interactions with their biophysical environment” (p. 132). That study investigated complementarity among different knowledge types in agricultural science through an analysis of the stakeholder perspectives: in this case, heather specialists (expert knowledge), a selection of scientific literature on heather plants (scientific knowledge), and local beekeepers who produced heather honey (traditional ecological knowledge). The authors found that not only did the knowledge held by each stakeholder not contradict the others, but each type of knowledge was complementary to the rest. Léhebel-Péron et al. writes that this complementarity was “a strong argument for enhanced communication and sharing between academic and folk sciences...to produce a more complete body of knowledge” (p. 141). Tacit, professional, traditional, and other types of knowledge can all hold tremendous value in research, and should not be disregarded or devalued in the interests of preserving existing knowledge hierarchies.

Because of the widespread acknowledgement that research knowledge on its own is often insufficient and dialogue between researchers and non-academics is needed, there have been increasing calls in academia to “open up” or democratize science by including non-researchers in research. Carolan (2008) writes, “By democratizing science, experts and non-experts stand on equal epistemological footing, recognizing that they each bring valuable observations and

insights to the decision making process” (p. 509). Knowledge democratization can be understood as the breaking down of knowledge hierarchies, the rejection of the scientific monopoly on knowledge, and the valuation of non-scientific knowledge types (Carolan, 2008). Several research strategies may be deployed to enable the democratization of knowledge. For example, Unger et al. (2020) proposes that pursuing participatory action research (PAR), a research methodology that considers those directly affected by a research problem as the best source of knowledge on its potential solutions, could support closer collaboration between researchers and non-researchers.

### **Objections to Knowledge Democratization**

Some have suggested it may be risky to elevate non-expert knowledges in certain discourses, since this may amount to devaluing research knowledge in order to prop up viewpoints not supported by evidence (Nichols, 2017). Critics of knowledge democratization argue that saturating the discourse with non-experts’ opinions could undermine the public’s confidence in established scientific knowledge. Furedi (2004) maintains that the trend toward knowledge democratization has resulted in the plummeting of academic standards and an epidemic of cultural and political disengagement. Nichols also raises legitimate concerns about the devaluing of intellectualism in the public discourse on scientific issues: he sees in American culture a rise in “hostility” toward expert knowledge, which he equates with “the insistence that every opinion on any matter is as good as every other” (p. 20).

Furedi and Nichols are correct in their assertions that outright hostility to research knowledge is problematic, and that some basic level of trust in scientific institutions is critical to a functioning society. The dangers of completely disregarding research as a valuable source of knowledge have been made especially plain during the COVID-19 pandemic, in which public

trust in medical expertise was repeatedly undermined by non-scientific conspiracy theories with disastrous consequences (Bloom & Quebec Fuentes, 2020). However, knowledge democratization does not mean uncritical elevation of all non-expert viewpoints in the discourse. Rather, it refers to the expansion of the definition of expertise to include non-researcher and non-academic perspectives (Petts & Brooks, 2005). We can include alternative knowledge types, such as traditional, tacit, and professional knowledge, without elevating dangerous or misinformed viewpoints unsupported by evidence of any kind. And in most cases, though with important exceptions, the authority of research knowledge is still well entrenched in society and not in significant danger of toppling from its privileged position. Thus, the introduction of alternative viewpoints and non-academic perspectives is not in great danger of undermining the legitimacy of scientific knowledge on a broad cultural scale (Burke & Heynen, 2014; Petts & Brooks, 2005).

Proponents embrace knowledge democratization not only for the sake of equity or justice, but also to improve the overall quality of research knowledge and outputs, as the lone perspective of an academic researcher is inherently limiting (Burke & Heynen, 2014; Unger et al., 2020). Therefore, knowledge democratization is here presumed to be an important component of successful KMb, contrary to the assumptions of the deficit model of research communication. But to engage in sincere knowledge democratization and deconstruct oppressive knowledge hierarchies, researchers themselves must also agree that knowledge democratization is worthwhile and valuable.



### **Researcher Perceptions of KMb**

A consistent finding in the literature is that one of the main barriers to effective KMb is competing perceptions among researchers about what KMb is, how it works, and who it is for. Although opinions vary, researchers often consciously or subconsciously adhere to the deficit model of KMb, a perspective antithetical to the notion of knowledge democratization. Ironically, the persistence of deficit model thinking among researchers could in part be the result of a breakdown in KMb, resulting in a knowledge-to-practice gap (Powell et al., 2017). Some researchers may conceive of the public as a homogeneous “other,” and believe that KMb largely consists of “educating” them (Davies, 2008; Simis et al., 2016). In one study, 75 per cent of coded responses from full-time, tenured and tenure-track university scientists in a discussion group described the public as “unscientific” and “other,” with 18 per cent expressing that the public “are not a part of and should not be involved in science” (Simis et al., p. 408). Davies also found that many researchers perceive KMb as a difficult process with potentially disastrous consequences if done ineptly; participants sometimes expressed that “[t]he public’s lack of discernment and inability to handle science correctly is what makes communication a dangerous process” (p. 422). Burke and Heynen (2014) assert that “scientists consider public engagement to be socially important but of little or no professional benefit—and, indeed, of possible harm” (p. 10). It would seem impossible to plan and execute an effective KMb strategy if you believe it holds only limited professional value, that the public is not interested in your work, and that even if they were, they would not understand it.

Simis et al. (2016) offers several explanations as to why the deficit model continues to manifest in the attitudes and beliefs of researchers. Firstly, they theorize that scientists presume their non-academic stakeholders will process scientific knowledge in the same objective, rational

manner that scientists do, and do not consider interpretive communicative processes in their communication strategies. Simis et al. further theorize that the education systems that produce STEM graduates do not prepare them to communicate publicly about their research. The authors also found that researchers who demonstrated more derogatory or dismissive attitudes toward the social sciences, which tend to place higher value on knowledge co-creation and subjectivity in KMb, were more likely to express deficit model thinking. There is therefore some evidence to suggest that training in humanities and social sciences may result in more positive opinions of the KMb process among scientists, although, “Ironically, a push for social science course requirements in the hard sciences is itself a form of deficit model thinking” (Simis et al., p. 404).

### **University-based KMb**

Colleges are not well represented in the literature on KMb, but several studies have been undertaken to examine researchers’ experiences of KMb in Canadian universities and other large research institutions. Existing work has found that significant institutional barriers are limiting the success of KMb for some Canadian researchers. A consistently reported lack of funding, time, administrative support, and professional incentive all seem to contribute to poor KMb outcomes for researchers at Canadian universities (Cooper et al., 2018). Cooper et al. (2018)’s Canada-wide study of KMb practices of university-based education researchers concluded that the universities were not well-equipped to support KMb activities due to their sustained focus on “generating publications within academic communities rather than making research accessible and useful to practitioners and policy makers” (p. 4). Participants in that study reported a lack of institutional supports for KMb at their universities, notably including insufficient internal funding and administrative support.

As recognition of the importance of KMb continues to grow, a number of guides and supports are now available to help researchers develop and execute KMb plans (Baron, 2010; Bennet & Bennet, 2007; Wilkinson & Weitkamp, 2016). Researchers are now encouraged to use a wide variety of research communication techniques, from the conventional to the experimental. Wilkinson and Weitkamp (2016) offer a series of strategies for stratifying audience segments and tailoring channels and messages for each stakeholder, as well as advice for how to listen to stakeholder feedback and encourage two-way dialogue. Similarly, Baron (2010) encourages researchers to become familiar with media systems and learn how to speak with journalists about their research in an accessible and interesting way that does not sacrifice nuance. In the Canadian context, SSHRC offers comprehensive guidelines as well as financial support for engaging in KMb activities as a Canadian researcher (SSHRC, 2019b). Many have proposed that social media holds promise for research communicators, especially when used to connect with communities of practice (e.g. see Phipps et al., 2012). In these guides to KMb, researchers are frequently encouraged to draw upon techniques from public relations, marketing, and organizational communication, and to become familiar and comfortable with a variety of communication tools.

Yet researchers often report that they feel under-prepared for the task, and some struggle with essential KMb skills (Cooper et al., 2018). Davies (2008) found that researchers consistently characterized KMb as a difficult, dangerous process, and occasionally believed that small errors would result in catastrophe. As a result, various kinds of formal training for researchers is frequently recommended, particularly for skills like plain language writing, public speaking, social media management, and media relations. While this approach is highly beneficial for researchers with the time and interest to learn these skills, is it reasonable to expect

all researchers to also absorb and deploy an entirely new set of highly specialized skills on top of their existing area of expertise?

One suggestion forwarded by Cooper et al. (2018), Phipps et al. (2012) and others is the use of KMb intermediaries or “knowledge brokers”: professionals who can work with and on behalf of researchers to carry out specialized KMb activities. This strategy is used by several Canadian universities, including York University, which has its own dedicated KMb unit (Cooper et al., 2018), but this organizational choice seems to be a rarity in Canada (Phipps et al., 2012). As we have established, effective KMb requires training and practice (Cooper et al., 2018; Powell et al., 2017). Since researchers already struggle to find the necessary time, funding, and resources to engage in KMb, it makes sense to delegate elements of this vitally important task to people with specialized KMb skills. This is certainly not a panacea to all the pitfalls of KMb but it may help to alleviate some of the difficulty currently faced by researchers.

College researchers do not seem to experience the same professional pressure to produce academic publications and present at academic conferences as their university counterparts (Williams, 2014). However, colleges also receive fewer research dollars than universities; in 2020, the 10 colleges reporting the highest research income received an average of roughly \$10 million per institution (Research Infosource, 2020a), and the top 10 research universities averaged over \$500 million per institution (Research Infosource, 2020b). Knowledge brokers, knowledge mobilization specialists, and similar KMb positions are often funded by research grants rather than through base operational funds, making their work contingent on success with research grants. Some colleges do not even have a research support office, much less a dedicated KMb unit (Phipps et al., 2012). It remains to be seen whether and how these institutional barriers to KMb occur within the college context.

As this literature review has demonstrated, thorough investigations have been conducted examining the nature of knowledge and knowing (e.g. Cherlet, 2014; Gaudet, 2013; Greenhalgh & Wieringa, 2011), knowledge democratization (e.g., Carolan, 2008; Léhebel-Péron et al., 2016; Petts & Brooks, 2005), researcher beliefs and attitudes about KMb (e.g., Davies, 2008; Simis et al., 2016), and KMb practices and tactics (e.g., Baron, 2010; Cooper et al., 2018; Phipps, 2012; Wilkinson & Weitkamp, 2016). It is clear that, despite compelling evidence to the contrary, the notion persists that knowledge democratization could threaten the authority of scientific expertise, leading to widespread skepticism toward a democratized approach to KMb. It is also clear that university researchers often do not have sufficient time, funding, resources, and institutional support to engage in meaningful forms of KMb. Colleges, with their more limited resources, may experience these issues on an even stronger scale. However, a gap in the literature remains: How can these understandings of KMb be applied in the context of a college, rather than a university or other large research institution? Given the emphasis on context that characterizes most KMb literature, a context-specific investigation of this phenomenon is required.

### **Methodology**

To answer my research questions in a way that complements the existing literature and advances the discourse, I explored how KMb functions when it occurs in a college context, including how researchers perceive KMb and how they can be best supported by their institution to achieve KMb success. The following research questions were explored: “How do college researchers define and understand KMb?” and “What are the main *barriers* to and *facilitators* of effective KMb in the college context?”

The following sections will explain and justify the research design, explore the merits and limitations of the methodological approach, and provide a detailed explanation of the data collection and analysis procedures.

### **Qualitative Research Design**

Given the exploratory nature of the proposed research, I engaged in a qualitative line of inquiry using in-depth interviewing techniques. I conducted semi-structured interviews with researchers (project directors, research associates, knowledge mobilization specialists, and senior research administrators) working at community colleges and polytechnic institutions based in a Canadian province. I included only those research personnel who have been directly involved in a federally funded research initiative via the Tri-Council College and Community Innovation (CCI) research fund. The goal of the interviews was to understand researchers' experiences and perspectives related to KMb. In particular, I was interested in understanding how participants understand and define KMb, which features of their research environment facilitate KMb effectively, and what barriers they encounter in executing KMb strategies. Interviews were flexible and open-ended, and I used qualitative, inductive coding strategies and thematic analysis to interpret the data.

One major theoretical lens guiding my methodology is social construction. As demonstrated by the literature, knowledge creation and communication are collaborative and iterative processes driven primarily by social interaction (Burke & Heynen, 2014; Cherlet, 2014; Leeds-Hurwitz, 2009). In communication research, a social construction approach necessitates reflexive thinking and "an awareness of the researcher's role in conducting research" (Leeds-Hurwitz, p. 894). I used the social construction principle throughout my research process, which meant maintaining a reflexive awareness of my own role in co-creating the knowledge through

dialogue with my participants, as well as of my implicit biases and assumptions, and how these may affect the data (see **Interview Procedures** for further discussion).

The main utility of qualitative interview research is to co-create knowledge with the perspective that “complexity in data sets needs to mirror the complexity of social phenomena” (Bamberger et al., 2012, p. 294). Rather than aspiring to scientific objectivity, which the qualitative researcher largely rejects as impossible, in-depth interviewing embraces subjectivity as an essential part of the research process that can enhance understanding (Merrigan et al., 2012). Qualitative methodology reflects the theoretical perspective that knowledge is complex, negotiated, and co-constructed by multiple participants in a dialogue, and is not discoverable through objective inquiry (Merrigan et al., 2012). It also considers the positionality of the researcher and the unique experiences and perspectives they bring to the research (Bourke, 2014). Qualitative interviewing and inductive analysis are also best used when existing literature on the topic of interest is scarce (Merrigan et al., 2012; Del Rosso, 2018), as is the case for this research.

### **Participant Selection and Recruitment**

Several inclusion criteria were used to narrow the focus of this research. First, I focused on institutions located in only one Canadian province. Keeping all participants within the same provincial borders helped protect the validity of the findings, since post-secondary education systems are subject to provincial regulations, histories and mandates which vary significantly from province to province. The province has been anonymized to protect the confidentiality of research participants, since recipients of the CCI program constitute a relatively small population. A second criterion for participation was that participants must currently be or have recently been engaged in federally funded College research initiatives supported by the Tri-

Council College and Community Innovation (CCI) funding program (whether as a project director, research associate, knowledge mobilization specialist, or senior research administrator). The CCI program is Tri-Council's only suite of research funding awarded exclusively to colleges. At the time of writing, this multidisciplinary program includes nine separate funds addressing a range of different project scopes, objectives, and subject areas. The program's objective "is to increase innovation at the community and/or regional level by enabling Canadian colleges to increase their capacity to work with local companies, particularly small and medium-sized enterprises" (NSERC, 2020b). The program largely focuses on commercialization and technology transfer research, but some promote outcomes such as KMb, networking, and social innovation. For all funding streams in the CCI program, institutions must name industry or community "partners," who contribute to the research with cash or in-kind resources and who are usually the primary beneficiaries of the research outputs. Usually, CCI also requires partners to be actively engaged in all stages of the research project and to contribute statements of support to the proposal.

My original plan was to recruit only participants who were named as project directors on the CCI grant application. My reasoning was that, as the leaders of their initiative, project directors ostensibly have the most comprehensive knowledge about the research. However, it became clear through my preliminary research that the "boots on the ground" research work, including KMb, is just as often conducted by other members of the research team and sometimes by senior research administrators, who are usually named as the lead applicant on CCI proposals. Senior administrators may have varying degrees of direct involvement in the research and sometimes retain primary responsibility for a project's outputs. To account for this, I amended my original recruitment plan to include research associates, senior research administrators,



knowledge mobilization professionals, and other technical and academic research team members. The requirements for participants to have formal involvement with a CCI-funded initiative and detailed knowledge of the initiative's operations were not amended.

Participants in a range of research roles were invited to be interviewed for the research. In total, I interviewed 11 participants representing six community colleges and polytechnic institutions from across the selected province. Participants consisted of project directors and research associates ( $n = 7$ ), senior research administrators ( $n = 2$ ), and knowledge mobilization specialists ( $n = 2$ ). Although not technically researchers themselves in the strictest sense, the KMb specialists who participated were considered part of their respective research teams (i.e., they reported to a research manager) and, naturally, they were intimately familiar with the team's research and KMb activities. Both senior research administrators who participated were named as lead applicants on recent CCI proposals from their institutions. One administrator did not engage directly in the research but occupied a project supervisory role, and the other frequently participated in the "hands-on" execution of the research. Some participants were directly invited to interview because they were visibly and publicly involved in CCI-funded research and their contact information was discoverable online ( $n = 7$ ). The others were recruited through more snowball-style sampling (i.e., I was referred to them by other research participants or through their institution's research support office;  $n = 4$ ).

**Table 1**

*Participant Characteristics*

<i>Participant Characteristic</i>	<i>Classification</i>	<i># of participants</i>
Institutional affiliation	Community college	6
	Polytechnic	5
Role/Occupation	Project Director/Research Associate	7
	Senior administrator	2

	Knowledge mobilization specialist	2
Primary stakeholder group	Community-based	4
	Private Sector	7

Participants also represented a diverse range of research areas, including chemical engineering, community health, and environmental science. Some participants' primary stakeholders were industry and private sector ( $n = 7$ ) and the rest worked more often with non-profits and community-based organizations ( $n = 4$ ). Although including participants from a range of disciplines and research traditions added complexity to the analysis process, it also enriched the data with diverse perspectives (Merrigan et al., 2012) while ensuring that enough participants could be recruited from a relatively small study population. Because researchers in different disciplines often adhere to different norms for stakeholder engagement and KMB, and because objectives, methodology, and deliverables can all vary widely along these lines, the discipline of the participant was considered during analysis phase, and discrepancies in perspective due to different methodological or academic approaches are explored in the **Discussion** section.

### **Interview Procedures**

Semi-structured interviews are a useful data collection technique when the researcher seeks depth and richness in the data. A middle ground between structured and unstructured interview styles, semi-structured interviews involve preparing a set of questions but being open to pursuing tangents, shuffling the question order based on conversation flow, posing follow-up questions, and embracing a flexible interview style (Bamberger et al., 2012). The interview guide used in this study is available in Appendix A.

Due to limitations caused by both geographical distance and the realities of COVID-19, all interviews took place via videoconference (Zoom or Microsoft Teams according to the

preference of the participant). The main advantages of video calls as an interview medium are that they closely replicate many conditions of an in-person interview, helping the interviewer build trust and rapport, and they can be recorded and replayed later during the transcription and analysis phase. Having an audiovisual recording of each session for transcription and analysis is valuable, especially for qualitative inquiry where non-verbal cues are sometimes considered alongside spoken words as part of the dataset. However, one disadvantage of this medium is the prevalence of “Zoom fatigue,” a phenomenon caused by an excess of virtual meetings that has become well documented in the wake of the COVID-19 pandemic (Wiederhold, 2020).

Videoconferencing is not always compatible with our natural communication preferences; the increased number of distractions caused by the virtual setting, the extra mental effort needed to read and respond to visual cues, and the discomfort of being the subject of a sustained, focused gaze can all contribute to Zoom fatigue (Wiederhold, 2020). Especially since videoconferencing became the norm for millions of people during the COVID-19 pandemic, Zoom fatigue may have had subtle effects on the data.

Toward the end of each interview, participants were invited to ask questions or share any additional thoughts or insights, and some participants took the opportunity to ask me about my perspective on the topics we had been discussing. I answered honestly, sometimes relaying experiences or observations from my professional life or insights I had discovered from my literature searches. After hearing my perspective, participants usually engaged further in discussion with me, agreeing or disagreeing with something I had said or asking follow-up questions, and this more free-flowing conversation was included in the dataset (only participant responses were coded). Hearing my perspective occasionally seemed to make interviewees feel

more comfortable to share additional insights of their own, and this approach yielded several interesting data points that the more structured portion of the interview had not provided.

Using the audiovisual recordings, I transcribed the interviews verbatim and wrote a summary of around 200 words for each transcript. The summaries were brief, interpretive accounts of what I perceived to be the most salient ideas and insights from each conversation. I shared the transcripts and summaries with all participants who opted to receive them, and they were invited to review and edit their transcripts and summaries. Most took advantage of the opportunity: 10 out of 11 participants opted to review their documents, and eight of these responded when contacted for edits. Four participants returned their transcripts and synopses with no edits. Two participants returned their transcripts with light or moderate revisions (i.e., up to about 10 changes) and one participant sent extensive revisions (200+ changes). Another participant requested a follow-up videoconference call with me in order to review the transcript in real time and clarify any possible misinterpretations. These interactions helped ensure that I was capturing participants' meaning as closely as possible and acted as a check on my preconceptions and biases. One drawback to this approach was that it is possible that the participants who did not return edits were simply unable to respond within the time frame I requested (participants were originally requested to respond within two weeks, but edits were accepted up to six weeks after the first request). Interviews lasted up to an hour and transcripts averaged 10–12 single-spaced typed pages, so reviewing the transcripts may have placed a heavy demand on participants' busy schedules.

### **Data Analysis**

Interview transcripts were de-identified and tagged using an alphanumeric code. I used a qualitative approach known as thematic analysis, which is a highly flexible analytical method

that supports rich qualitative inquiry (Nowell et al., 2017). Before engaging in data analysis, I read over each transcript in its entirety multiple times, making notes in the margins of each transcript. This helped create familiarity with the transcripts and enabled easier retrieval of information. To start the content analysis, I allowed my original research questions (*How do college researchers define and understand KMb? What are the main barriers to and facilitators of effective KMb in a college context?*) to guide the analysis and support the construction of codes and themes, but I embraced a flexible approach that allowed codes to emerge naturally from the data. From these research questions and based on participant responses, I developed my final codes and themes, which are summarized in Table 2. With an inductive strategy, themes are developed during the analysis phase rather than before, as unexpected themes in the data may cause the researcher to use alternative approaches to analysis (Del Rosso, 2018). I embraced the flexible, inductive approach to analysis while still allowing my research questions to guide the process. After my first full read-through of the data several codes emerged that seemed to fit into five overarching themes, including *Barriers*, *Facilitators*, *Strategies*, *Risks*, and *Benefits*, as these directly corresponded to my research questions and also seemed to reflect what was emerging in the data.

However, it became clear as analysis progressed that these themes were resulting in significant overlap. For example, it was often unclear whether an obstacle mentioned by the participant should be interpreted as a “barrier” or a “risk”; several codes fit into multiple themes (for example, the intellectual property management was discussed by participants at varying times as a risk, barrier, and facilitator; and “funders” were also discussed in nearly every theme). Although complexity and contradiction is natural when participants are asked to define and describe their experiences with abstract concepts like KMb, I embraced the flexibility of the

inductive approach and ended up revising all codes and themes in an effort to improve narrative clarity. From the qualitative interviews, six overarching themes emerged and will be described in the **Findings** section: *Defining KMb, Risks and Risk Management, Tools and Tactics, Role of the Institution, Role of the Research Funder, and Intellectual Property*. The final theme, intellectual property, was added later in the analysis as it was raised multiple times by several participants, and it was clear that the control and ownership of IP were important sources of meaning, conflict, and opportunity for them. Before exploring the themes, however, I will first provide an overview of the measures taken to ensure rigour and trustworthiness in this thesis.

My research questions evolved somewhat during the analysis phases of this research. In early stages of the research, my first research question was, “How do college researchers understand the value and purpose of KMb?” I was interested in discovering what kind of value researchers attached to KMb, whether they thought of it as a worthwhile activity, and in what ways they found it to be worthwhile. However, I found that in the interviews, although many participants discussed their estimation of KMb’s value and purpose, many others described KMb in a more neutral way that did not imply any particular value system. These more neutral definitions yielded important insights to how researchers approached KMb, and they were so central to the findings that it was necessary to adjust the wording of the first question to include them. Asking instead how researchers defined and understood KMb included neutral, positive, and negative estimations and definitions of KMb. Qualitative research designs are highly flexible and able to accommodate emergent shifts in research direction, so I was able to integrate the updated question wording into my analysis without difficulty. The original wording of the first research question appears in the Interview Guide in Appendix A.

## **Rigour**

Although thematic analysis is a useful approach for this research, it has been criticized for the challenges it presents to academic rigour (Nowell et al., 2017). This is a criticism common to many kinds of qualitative analysis strategies, including qualitative content analysis (Vaismoradi et al., 2013). A general lack of literature on thematic analysis has also led to inconsistent approaches among researchers (Nowell et al., 2017), necessitating a rigorous, documented approach to this thesis. Different elements of rigour and how these were established in this thesis are described below.

To establish *trustworthiness*, a key indicator of rigour in qualitative studies, a qualitative researcher must establish that her conclusions are supported by the data and that her processes are consistent and precise (Nowell et al., 2017). Nowell et al. suggests four criteria to establish trustworthiness in a study that uses thematic analysis: credibility, transferability, dependability, and confirmability. Transferability is “the generalizability of the inquiry” to other cases (p. 3). Only the reader can determine whether the research has transferability to her unique context, but it is up to the researcher to provide as rich a description as possible to facilitate this kind of evaluation (Kuper et al., 2008); to that end I have engaged in narrative description to provide as detailed a context as possible. Confirmability “is established when credibility, transferability, and dependability are all achieved” (Nowell et al., 2017, p. 3). I will therefore focus most closely on the criteria of credibility and dependability in this section.

According to Nowell et al., credibility “addresses the ‘fit’ between respondents’ views and researchers’ representations of them” (p. 3). For the current research, my strategy of sharing the transcripts and interview summaries for participants to review and edit has helped to fulfill this criterion. Especially helpful was the feedback I received on the 200-word transcript

summaries that I prepared for each transcript. Not only did the summaries give participants a convenient at-a-glance version of the interview, saving them the time and effort of reviewing the full transcript in detail, but it also gave me an opportunity to check my interpretations of participants' meaning, as opposed to merely reciting participants' verbatim responses. This approach helped to establish "fit" between my participants' words and my interpretations.

Dependability is another important component of trustworthiness. According to Nowell et al., this criterion is met when "the research process is logical, traceable, and clearly documented" (p. 3). I kept detailed records of my research process, which included maintaining careful and complete records of participant communications, interviews, and edits. My coding and analysis process was also carefully recorded. All records were kept secure in a well-organized computer filing system.

Inter-coder reliability, which is "the extent to which more than one coder independently classifies material in the same way as peer researchers" (Vaismoradi et al., 2013, p. 403), is another measure that has been used to evaluate rigour in qualitative studies. However, this measure may not be helpful for evaluating thematic analysis, which is less concerned with the frequency and objectivity of the codes and more concerned with the quality of thick description (Vaismoradi et al., 2013). An inter-coder reliability check has therefore not been conducted for the current research; it is possible that another researcher would derive completely different codes and themes after examining my data. However, I have thoroughly documented and justified my interpretations and conclusions using the criteria set out by Nowell et al. in this thesis. I have also discussed my coding process with my supervisory committee, who challenged my interpretations and classification systems, causing me to return to the data to make modifications. These measures have all contributed to the rigour of this study and helped



demonstrate trustworthiness despite the challenges inherent to the methodology (Nowell et al., 2017).

In the next chapter, I will relay key insights and findings from the data, and follow up with a brief Discussion in which I engage in some higher-level analysis.

### **Findings**

In this section, I will provide an overview of key insights derived from the interviews. In keeping with my qualitative approach, I will present the findings in a narrative-style summary that highlights the most salient themes. Deeper interpretation and discussion will follow in the next chapter (**Discussion**). I will also refrain from identifying participants by name or pseudonym in the interests of preserving confidentiality.

The 11 interviews yielded a wide range of diverse perspectives on KMb. Six overarching themes emerged, including (1) defining KMb; (2) risks associated with KMb and strategies for managing them; (3) KMb tools and tactics; (4) the role of the institution in KMb; (5) the role of research funders in KMb; and (6) intellectual property management. Codes were then derived for each of the six themes that help flesh out and characterize the content of the interviews and highlight key insights. These codes and themes are summarized in Table 2 with examples from the transcripts. In the following sections, I will explore each theme in depth, share illustrative quotes and sample codes, and provide some initial interpretation of participant comments. These six themes will be explored in order in the following sections, beginning with “Defining KMb” as this was the topic discussed first in the interviews and it provides important context for what follows.

**Table 2**

*Codes and Themes*

Theme	Code	Evidence from transcripts
Defining KMb	Guides future research	“One of the main benefits [of KMb] is...hearing the questions that then guide the next research proposal.”
	Wide range of knowledge users/stakeholders	“I think knowledge mobilization can happen with pretty much any segment of the population. So it’s beyond just stakeholders.”
	Can be unplanned/spontaneous	“You never know [when] what you’re doing is going to inspire someone else to think about it outside the box.”
	There are different levels/dimensions of “knowledge”	“We are in a very information-heavy world, but really being able to understand and apply knowledge broadly is challenging.”
	Elevates research quality	“My hope is that [ongoing stakeholder engagement] produces better information. Better data, better evidence, because you have that kind of involvement.”
	Informs decisions	“[KMb] allows us to provide practitioners, land managers, folks that are out there doing work with the best practices, so they’re informed of these decisions they need to make”
	Educates/engages the public	“The public ... [might] even become advocates in the public policy debates that come out of [the research]”
Risks and Risk Management	Politicized research environment	“If [research is] done on anything that could be perceived to have a political aspect to it, when you have a polarized environment, there are going to be people who make assumptions about that.”
	“Non-critical” audiences	Primary risk is dealing with “an uninformed or non-critical thinking consumer that takes [the research] and uses it inappropriately or denigrates it”

	Challenging the status quo	“There are sacred cows out there and you have to be really careful about how you slaughter those”
	Media misreporting	“He [the reporter] was implying something he wasn’t supposed to, and holy cow, the reaction was ugly.”
	KMb as no-risk or low-risk	“Any risks? Hm. None that I can think of.”
	Risks can be mitigated	Risks of misunderstanding can be contained “if we have good agreements right at the beginning”
Tools and Tactics	Academic articles	“Getting [your research] into a journal doesn’t mean they actually get out to the practice of the people who are doing the work.”
	Non-academic knowledge products	“Non-academic journals or online magazines is another avenue. Some are for a general public audience and some are focused on industry activity.”
	Events and presentations	“Field tours are an invaluable resource for folks.”
	Impact of COVID-19	“[The pandemic] forced us to think outside the box”
Role of the Institution	Communications and marketing support	“I’ve been amazed at the final products” when working with communications
	Support from other departments	e.g.: Business development, event services, IT, and institutional research departments
	No “publish-or-perish”	“It doesn’t matter if I publish in an academic journal. I’m allowed to modify my knowledge mobilization plan to best fit the needs of my partner, the needs of the research, and its best potential.”
	Long approval process	There are “too many cooks in the kitchen” for approving KMb outputs
	Lack of support for multimedia KMb	“Multimedia knowledge dissemination is a whole lot different from traditional methods...and not inexpensive”
Role of Research Funders	Funding structure incentivizes KMb	“If I haven’t done knowledge transfer well, I’m not going to get funding.”

	Industry is incentivized to invest in research	“Innovation in industry has been very much at the forefront. That industry is all based on research and innovation ... You have all sorts of different groups doing research and supporting that industry and coming up with new technologies all the time.”
	Non-profits don't have the resources to invest in research	“In my area in particular, it's really challenging because social innovation means you're working with non-profits. They don't have money to support research; they don't even have money to keep their doors open from time to time.”
	More flexibility needed for KMb strategies	“It's really hard to know the best form of knowledge mobilization when you're writing the application”
	Funders should offer more course release time	“[SSHRC] only allow for one course release per year, which doesn't make sense. This term I'm working [as] a full instructor, I'm teaching four courses.”
	More funds are needed to support digital media / multimedia KMb	“Inclusion of multimedia grant funding in tandem with applied research funding will help meet the KPI's that enhance KMB”
Intellectual Property Management	IP puts limits on what can be shared	“Because of the nature of the market competitiveness involved, we're not allowed to disseminate proprietary knowledge in the public domain... Sometimes [that] can be a challenge.”
	Legal review causes delays	“It's in draft and waiting for publication from my industry partner. It's been waiting for six months.”
	No support for commercialization research	“There is a gap between the concept and where places like [local innovation networks] will pick it up. So you have something you have created, how do you turn it into a product out there in the world?”
	IP causes miscommunication and confusion	For partners, “I don't know if [IP is] a concept they even think about. It's not on their radar.”

Each of the six themes are explored separately below.

### **Defining Knowledge Mobilization**

Participants shared a variety of perspectives on the definition of KMb. To begin the interview, all participants were read the following working definition of KMb, which incorporated many elements of KMb described in the literature (Gaudet, 2013; SSHRC, 2019a; Greenhalgh & Wieringa, 2011), and were asked if they would change or add anything:

*KMb is the process by which researchers engage with their stakeholders (research partners, collaborators, the scholarly community, students, knowledge end users, etc.). It can take place before, during, and after the research. Examples include stakeholder meetings, public presentations, social media campaigns, workshops, and publications.*

Participants offered various amendments and suggestions to this definition. One participant indicated that KMb refers to long-term, ongoing involvement with stakeholders (e.g., through membership on a community board) in addition to the short-term, discrete activities listed in the definition. Another participant described KMb as “continually evolving” and “a learning process.” KMb was often described as a reciprocal phenomenon, with a few participants reporting that stakeholders helped drive future research directions: “One of the main benefits [of KMb] is...hearing the questions that then guide the next research proposal.” A number of participants suggested that the definition of KMb should acknowledge the existence of different types of knowledge to which different priority levels can be assigned. One participant articulated a distinction between what they called “information,” or surface-level findings, and “knowledge,” which occurs when information is applied and contextualized: “We are in a very

information-heavy world, but really being able to understand and apply knowledge broadly is challenging.”

When discussing the examples listed in the working definition, some participants thought examples should include spontaneous instances of KMb, since KMb frequently occurs informally and even unintentionally. One participant explained that a lot of KMb occurs during organic moments such as “the time you spend walking back and forth from the truck where you’re talking with your colleagues.” Participants reported that their research findings were also often applied to unexpected purposes by unexpected stakeholders, and sometimes even in seemingly unrelated fields. One participant described having to make “a switch” in thinking to accommodate all the ways that their findings could be used: “You never know [when] what you’re doing is going to inspire someone else to think about it outside the box.” Because their research was accessed and used by such a range of people and organizations, one participant felt the researcher-stakeholder dichotomy posed in the definition was too restrictive: “I think knowledge mobilization can happen with pretty much any segment of the population. So it’s beyond just the stakeholders.”

As discussed in **Key Definitions**, stakeholder is used as a catchall term throughout this thesis to refer to the people and entities who may be affected, directly or indirectly, by research outcomes. However, participants used a range of words when referring to stakeholders. Many referred to “clients” or “partners” when discussing the most direct beneficiaries of their work; one participant referred to “consumers” to describe any person who interacts with the research findings. Language use seemed to vary along disciplinary lines, with most participants whose primary stakeholders were in the private sector identifying “clients” and “industry” as their most important target groups; these participants also frequently discussed the importance of research

being “industry-led” or “industry-integrated.” For participants whose work was more community-based, stakeholders were more likely to include policymakers, non-profit organizations and community groups, as well as “the public” who could sometimes become “advocates” for the research. Participants from all academic disciplines referred to working with research “partners,” who could be from any sector and who supported the research with funding or in-kind contributions. Across most of the interviews, “partners” were frequently discussed as the primary target of KMb efforts, possibly because this is the language used by the CCI funding program (NSERC, 2020b).

Participants often described finding value in knowing that their findings were applied and useful, as well as in helping people solve practical problems and make informed decisions. A few participants discussed the larger potential for global impact, such as elevating Canadian research on an international stage: “I personally love to do international events and get our expertise out from [the province] into the whole global perspective.” Others discussed the benefits of cultivating more engaged and educated citizens in their home community. One participant described how the KMb process mitigated their biases as a researcher by including diverse voices in research: “Having so many people involved with that gave us perspective that [we] don’t necessarily have.” Many participants talked about how KMb can elevate the research quality, especially when it allows researchers to solicit feedback from their stakeholders: “That allows us to see, where are these problems happening? Are these resources valuable, and are they being implemented?” Most participants spoke about KMb in positive terms as a worthy endeavour that could elevate research quality, make findings useful, and create a productive and valuable dialogue between researchers and stakeholders.

### **KMb Tools and Tactics**

Participants reported using a wide range of KMb tools and tactics to share research with their stakeholders. Many participants compared traditional, academic forms of KMb, such as conference presentations and academic publications, with more technical or non-academic forms of KMb, such as industry reports and trade publications. Although some participants were ambivalent about the utility of academic publications as a KMb tool (as one participant said, “Nobody freaking reads them!”), others acknowledged that they had value in the right context and many reported that they regularly used academic journals and conferences as channels for KMb. A few participants said the main advantage of academic publishing is that it provides rigour in the form of peer review, which can often be lacking in less-academic knowledge products. One participant described their efforts to bring more rigour to non-academic reports by requesting review from professional and scientific associations. However, participants overwhelmingly reported that their main KMb targets were non-academic stakeholders and, consequently, that they tended to use non-academic dissemination strategies, especially technical notes and reports. A few participants said that their most important stakeholders did not typically have access to academic journals, rendering them an impractical method of KMb.

Many participants had research experience both in a university and in a college setting and compared the two institution types in their responses. Universities were generally described as being less likely than colleges to value non-academic KMb, although participants reported that neither type of institution considered non-academic KMb a driver of professional advancement the way academic publishing is considered to be in universities. Although most participants agreed that pursuing non-academic forms of KMb could be useful and effective, one participant said these activities were accompanied by a significant career-related trade-off: “It’s very



unlikely I will ever get a job at a university, because my CV does not look like a university professor's CV. I have not invested my energies into academic publications.”

Participants reported creating and sharing a wide range of knowledge products, which included online and new media, industry and public reports, academic publishing, events and presentations, stakeholder meetings, and artistic outputs. Many participants across a range of disciplines reported engaging in creative or unconventional forms of KMb, including video and photography, infographics, and other visual media. One participant used immersive virtual reality technology to engage in KMb with remote stakeholders; another published their lecture series in hard copy volumes and held an “industry book club” with students and industry partners. Other creative knowledge products included plays, short narrative films, graphic novels, and board games. Hosting and attending KMb events was another popular strategy identified by participants; these could include conferences, lectures, webinars, seminars, field days, brown bag lunches, continuing education courses, and public speaking engagements. Some participants engaged in market research to identify and address “gaps” in knowledge among their target audiences and then tailored KMb events to fill the gaps. These types of events reached a range of stakeholders, including research partners, regulators, students at all levels of study, representatives from industry and government, and researchers at other institutions.

Most participants reported that COVID-19 had disrupted KMb activities. Over much of 2020 and 2021, domestic and international travel were severely restricted and in-person events were often impossible. These circumstances were especially difficult for participants whose KMb strategies centred on in-person events like field days, which one participant called “invaluable” for KMb. Many KMb events and gatherings moved into online spaces, but others were simply cancelled or delayed indefinitely. For some participants, COVID-19 also caused

significant interruptions in service and staff reductions, resulting in loss of overall research capacity as well. However, some participants were able to find opportunities in these adverse circumstances. One participant said the pandemic “forced us to think outside the box,” making the research team consider how to make their KMb outreach activities more accessible both during the pandemic and beyond. Another participant said that travel restrictions had actually freed up the research team’s time and resources for other pursuits: “The inability to spend travel money has given us the budget to do some of the creative stuff that we want to do.”

Overall, participants described a diverse array of tactical approaches to KMb, including creative and “outside-of-the-box” strategies, and reported embracing flexibility to maximize KMb opportunities in challenging times.

### **Risk and Risk Management**

KMb was described by some participants as a risky activity. Participants across multiple disciplines reported struggling with the “politicized” environment that attended their research and affected their stakeholder interactions. One participant worried about the effects of toxic online discourse and was concerned with protecting the mental wellbeing of their research team and participants when conducting KMb in those environments. Several participants discussed the risks of mobilizing knowledge among “non-critical audiences” who may take what a researcher says “as gospel” without critical reflection. These kinds of audiences may even “twist” or “abuse” the knowledge for their own purposes. Other participants talked about the difficulty of broaching sensitive topics and challenging the status quo; as one participant put it, “There are sacred cows out there and you have to be really careful about how you slaughter those.” That participant had once been reprimanded for expressing scientific skepticism about ideas that their stakeholders held “sacred”: “I got flat out told that I was overly negative in technical discussions

and that I was not helpful. It impacted my pay structure for that year.” One participant described an experience where local media published a sensationalized and inaccurate account of their research, an experience that damaged their research relationships. Participants who had had negative experiences in this vein often emphasized the importance of not overestimating their stakeholders’ understanding of the research and taking a “careful” approach to KMb.

Although some participants viewed KMb as a risky undertaking, other participants were less concerned about the risks, and some struggled to think of any serious risks at all when probed. When asked about the risks of KMb, one participant said, “None that I can think of.” Another participant, after discussing the risks associated with inadvertently sharing proprietary information, added, “I don’t necessarily see that as a problem. I see it [as] a challenge.” One participant spoke extensively of the risks of *not* doing KMb, chief of which to them was Canada’s possible stagnation in the international research community. Echoed by several participants was the idea that, although risks are inevitable in KMb, they can usually be overcome with some combination of planning and good communication.

To manage the risks associated with KMb, participants implemented a number of strategies. Managing stakeholder expectations by using caveats, speaking precisely, and avoiding academic jargon were common risk mitigation strategies. Many participants said they tried to anticipate negative responses to their research and consider how they would respond to criticisms; others used rhetorical strategies that emphasized the limitations of the research and cautioned against jumping to conclusions. One participant said they relied on rigour and preparedness to reduce risk: “I want to make sure everything I say in that PowerPoint is very well-documented and it has backup.” One participant said that, before the research begins, they try to walk stakeholders through scenarios wherein the research produces undesirable results and asks stakeholders to

consider what their response to those outcomes would be: “Okay, so this is what [you think] you’re going to find. What if you find the exact opposite? Are you willing to deal with the fallout of a really bad finding?” According to this participant, asking stakeholders to confront the possibility of unwelcome findings helped to ensure that the research would not simply be ignored, misused or denigrated if it did not produce the “right” results.

Although there seemed to be a split among the participants in their estimation of the risk level of KMb, there also seemed to be general agreement that risks could be overcome and that they did not outweigh the value of engaging with stakeholders.

### **Role of the Institution**

Institutions play an important role in how KMb occurs. Many participants reported feeling supported by their institution in undertaking KMb, with one participant reporting that they enjoyed “robust” institutional research and KMb support. Another said, “I believe [my institution] is doing everything in their power to help me do my job.” Institutions supported participants by offering staff support for KMb from other departments, especially communications and marketing, as well as by facilitating KMb through more indirect or passive means, such as by eschewing the “publish or perish” mentality common in universities.

Participants frequently discussed receiving KMb support from other college departments, especially communications and marketing. Eight of the eleven participants talked about receiving support from their institution’s communications and marketing department in creating and distributing knowledge products, including photography, articles, videos, web content, and social media posts. Participants largely reported that this collaboration resulted in a higher volume and quality of knowledge products than the participants could achieve on their own: “I’ve been amazed at the final products... Once it’s gone through all those people, it’s really polished.” One

participant described receiving more support from communications than they could access: “We probably don’t use it enough for what’s available to us.” Besides direct support with producing KMb products, communications teams also supported participants by sharing access to larger, institution-wide communication channels and by providing advice and guidance on institutional brand standards. However, the tight control wielded by some communications departments over KMb outputs sometimes resulted in delays, reducing participants’ overall KMb capacity. One participant said that working through communications approvals “can add a couple weeks onto an output.” The same participant called the communications approval process “clunky” because “there [are] just so many cooks in the kitchen.”

Many participants described satisfaction with their institution’s approach to incentivizing KMb. Several participants were appreciative that their institution did not promote a culture of “publish or perish”; one participant said that colleges “don’t really care if we publish.” Participants were therefore not pressured to default to traditional academic dissemination where other methods would be more effective: “I’m allowed to modify my knowledge mobilization plan to best fit the needs of my partner, the needs of the research, and its best potential.” One participant who had previously worked in a university setting said, “I actually find knowledge mobilization far easier at a college” because of the “freedom” they experienced to carry out KMb in creative and unconventional ways at the college. However, some participants expressed a concern that lack of institutional oversight about whether and how often researchers publish their work may translate to a lack of rigour and accountability in KMb.

In terms of what institutions could do to better support KMb, participants shared a number of insights. For example, participants who occupied dual roles as instructors and researchers reported that they struggled to balance the demands of both roles. Institutions often

denied access to course release time for teaching faculty who wanted to engage in research, and release is frequently an ineligible or limited expense on research grants. Teaching faculty also found it difficult to travel to attend KMb events and conferences, since these typically take place during the academic year when they are in class. One participant also reported that their institution did not offer robust support for commercialization research, despite commercialization ostensibly being a key research priority and part of their institutional mandate for applied research (more discussion on this point is in the **Intellectual Property** section). Several participants expressed a wish that their institution could offer more support for the development of multimedia KMb, such as web and social media content. Some participants admitted to having limited skill and experience with multimedia communications and expressed a desire for training or other resources to help with this kind of KMb.

Although many participants described receiving important structural and departmental support for KMb from their institutions, these responses also shed light on gaps in these supports which should be examined and addressed.

### **Role of Research Funders**

Research funders were frequently mentioned as a key factor in the success or failure of KMb. A variety of organizations and programs fund research at Canadian colleges; government sources provide the lion's share, but colleges also receive research funding from private sector, non-profit, and other post-secondary sources (Colleges and Institutes Canada, 2018). All participants had been involved in major research projects funded by the Tri-Council CCI program, and several participants' jobs were partially or fully funded by a research grant rather than base operating funds from the institution. For one participant in this situation, the structure of CCI funding meant that they felt highly incentivized to engage in effective KMb because "if I

haven't done knowledge transfer well, I'm not going to get funding." Some participants reported receiving significant financial support from private sector research partners. The private sector was usually described as highly motivated to engage with researchers because their business is "driven" by research and they typically have more resources to invest in research than their non-profit counterparts do. However, some funders were perceived by participants not to prioritize KMb as a research activity at all. Especially with industry-supported research, funders were sometimes described as being uninterested in supporting wider KMb activities beyond the researcher-client relationship. As one participant explained, "Some funding organizations ...don't allow for [KMb]. They want just the data collection, data analysis, technical report, done. They don't want anything beyond that."

Some participants said it could be difficult to balance funder interests with the integrity of the research. For some, the dual role played by industry as both research funder and research partner was problematic for research integrity. One participant said that the truth-seeking nature of research was "100 per cent at odds" with being accountable to industry for research results, since they often had to avoid the inadvertent slaughtering of "sacred cows" in KMb activities to avoid conflict with funders (see **Risk and Risk Management**). Another participant expressed similar frustrations in receiving research funds from the provincial government, which also provides base operating funds for the entire institution. That participant described having to use careful language when sharing certain research results: "We can't really diss our funders... I feel like I'm often going and changing presentations and tossing language and being like, 'Yeah, you shouldn't say that.'"

Government research funders typically attach conditions to grants, which encourage accountability and provide focus and structure to the funding program. However, participants

said that granting conditions can be overly restrictive and create barriers to KMb. For example, funders did not usually allow course release for teaching faculty to engage with research; one participant explained how SSHRC's rule of funding only one course release per faculty member per year prevented them from engaging more deeply with the research. Participants also reported that funders required full, detailed KMb strategies at the project outset, but allowed little flexibility to change the plan later on, especially if funds need to be reallocated to a different budget line. This is an issue because, as one participant explained, "It's really hard to know the best form of knowledge mobilization when you're writing the application"; as findings emerge, researchers may want to adjust their KMb plans to suit the research's needs, but find themselves unable to do so without violating funder conditions.

A number of participants also reported a funding gap for the development of multimedia knowledge products. These were perceived to require special funder attention because "multimedia knowledge dissemination is a whole lot different from traditional methods...and not inexpensive." As discussed earlier, some researchers felt unprepared to engage in this type of KMb on their own, and others found that available funds and resources were insufficient. One participant proposed targeted grant funding specifically for developing KMb capacity in digital media, including through audiovisual content, animations, and social media.

Participants reported that other, more indirect funding decisions by the provincial government also had an effect on college KMb. Deep cuts to post-secondary institutions' core operational budgets were taking place at the time of this research, cuts which participants said reduced KMb capacity at colleges: "I'm relying on marketing and communications to help me with [KMb]. [But] they're all really busy, and post-secondary has received significant cuts in their funding from the government, so there have been lots of layoffs." One participant reported



that funding cuts to province-run information networks in their industry had placed an additional KMb burden on post-secondary institutions: “The assumption was that universities and colleges would pick that up and take it on with no real plan [and] no funding.”

College research is funded by a complex network of diverse sources, presenting a range of opportunities and challenges for researchers. Issues around research integrity, funder rules and regulations, and gaps in research funding opportunities should all be examined to produce stronger KMb outcomes.

### **Intellectual Property Management**

Although it was not always explicitly asked about, most participants discussed the ownership and control of intellectual property (IP)—enough for the topic to warrant its own theme. IP is the intangible creative or intellectual products of research that may or may not have commercial value, and is protected by patents, copyrights, trademarks, and other legal rights (Canadian Intellectual Property Office, 2020). In a research partnership, the ownership, use, and control of IP has to be negotiated, and IP discussions aim to balance the protection of proprietary information with the need to make research results public and useful. Most participants reported that, according to their institutional policies, IP rights belong to the industry partner by default, although researchers retained some copyright for non-commercial teaching or research purposes as per Tri-Council policy (NSERC, 2020b). While participants largely agreed that commercial IP rights should remain with the partner and even expressed relief at not having to engage in complex legal negotiations (“I’m quite happy [that] all IP is owned by our clients... I don’t want to have anything to do with the lawyers”), one participant speculated that researchers may be less motivated to pursue research programs if they know they will not be entitled to any of the resulting IP: “I don’t know how many of our staff will even want to take that on if they don’t

have intellectual property.” Some participants discussed the difficulty of deciphering the dense legal language of patents and other IP documents. One participant admitted to struggling with “patentese”: “Academics are completely blind for the most part to patents... It’s very challenging to actually interpret that as a scientist into like, ‘What the hell are they actually talking about?’”

Two other main KMb challenges were identified in relation to IP management. One was that lengthy IP review and approval processes caused delays for KMb activities. For example, one participant described waiting more than six months for an industry partner’s patent lawyers to approve publication of their public-facing report. The other risk was the stifling effect that IP control could sometimes have on KMb. When the industry partner owns most or all of the IP, the researcher is limited in what they can share with the public, a condition that many participants acknowledged as an obstacle. A few participants reported ambiguity in their understanding of IP ownership, saying that it is not always clear to them what they are allowed to share and with whom. One participant said that IP rarely came up in conversations with partners at all (“It’s not on their radar”), so there was always significant uncertainty on the research team’s part around what knowledge they were allowed to mobilize.

One participant relayed the difficulty they had faced in finding institutional and community support for commercialization research. One of the outputs of a recent research project was a product with potential commercial value that the participant wanted to patent and commercialize, but they found a frustrating lack of knowledge and resources. Reflecting on the experience, the participant said, “There is a gap between the concept and where places like [local innovation networks] will pick it up. So you have something you have created; how do you turn it into a product out there in the world?” To get support, the participant has accessed official and

unofficial information networks, but to no avail: “I’ve even reached out to our local innovation ecosystem partners to say, ‘I need information about this. If we want to commercialize it, what does this involve?’ And they haven’t been that helpful.”

The participants expressed a wide range of viewpoints and insights on KMb. All interviewees contributed unique insights, with each participant being quoted at least once in this chapter and most quoted or paraphrased multiple times. The diversity of these participants’ research roles, academic disciplines, and institution types (i.e.: community college versus polytechnic institution) likely all contributed to the diversity of perspectives and opinions reflected in the data. In the following section, I will offer some high-level discussion and interpretation of the findings.

### **Discussion**

This discussion will highlight key findings in light of the research questions, offer interpretations in light of key research literature in the area, and explore how these insights can be understood and applied in a broader context.

Participants’ descriptions of what KMb is and what it should be form a critical basis for this discussion, and supports the exploration of the first research question: *How do college researchers define and understand KMb?* The main characteristics of KMb identified by participants, such as its tendency to help inform decisions, involve a range of stakeholders, and educate or engage the public, were all relatively consistent with researcher perceptions of KMb that have been identified in previous studies (Davies, 2008; Simis et al., 2016). Other ideas raised by the participants included the perception that KMb involves a range of different “levels” of knowledge that have relevance to different groups and that KMb is critical to elevating the quality of the research. Because participants were selected from a pool of CCI-funding

recipients, they may be inclined to think of research in a more partner-centric way than other researchers, since their research was designed to “[enable] Canadian colleges to increase their capacity to work with local companies” (NSERC, 2020b). Research funded by the CCI program is usually designed in collaboration with a non-academic partner specifically to respond to the partner’s applied research needs, often with the additional requirement for broader applicability across the industry or field (NSERC, 2020b). This obligation means KMb was already built into many of the participants’ projects, and has probably played a role in shaping their understanding of the role and purpose of KMb.

Many participants agreed that KMb does not always take place in the form of planned, discrete activities as the working definition suggested, and that KMb is often continuous, informal and unplanned. KMb as a spontaneous phenomenon that happens through casual interaction as well as a meticulously planned set of tactics reflects the complexity of human communication, as well as the futility of trying to control the flow of knowledge at every turn. It was also interesting to note that KMb seems to happen not only at the initiation of the researcher, that partners sometimes undertake KMb responsibilities on the researcher’s behalf, and that stakeholders sometimes reach out to the researcher for specialized knowledge rather than the other way around. Still, this insight also suggests a need for college researchers to recognize and seize emergent opportunities to expand their stakeholder groups and to lend their research to unforeseen applications.

Despite the widespread prevalence of “deficit model” thinking among researchers that has been suggested in previous literature (Baron, 2010; Davies, 2008; Simis et al., 2016), participants generally seemed to embrace the idea that KMb is a complex, reciprocal phenomenon and were invested in involving non-researcher stakeholders in the discourse.

Because I introduced a decidedly non-deficit model definition of KMb early in the interview process for participants to consider, any predisposition to deficit model thinking may have been discouraged from the beginning. Still, in spite of this framing, traces of deficit model thinking were still identifiable in some participant responses. For example, most participants framed stakeholders' contributions to KMb primarily as "asking questions" or identifying gaps and problems rather than contributing their own knowledge toward a solution. In fact, the idea that stakeholders held expertise or knowledge that researchers did not—except in terms of identifying problems of practice—was rarely brought up or discussed by participants. Although participants did not explicitly claim to espouse deficit model thinking, many of their responses seemed to reinforce the same "knowledge hierarchies" described by Burke and Heynen (2014) wherein the role of non-researchers is to ask questions and the role of researchers is to answer them. This is out of alignment with the collaborative co-creation or democratization of knowledge encouraged by most contemporary KMb scholarship (Burke & Heynen, 2014; Carolan, 2008; Cherlet, 2014; Léhebel-Péron et al., 2016).

My second research question was *What are the main **barriers** and **facilitators** to effective KMb in the college context?* In terms of barriers, participants seemed to share many of the same perspectives about KMb risks that were expressed by participants in Davies' (2008) study on researcher attitudes toward science communication, supporting the finding that researchers feel the need to be "careful" with KMb "because the public will readily misunderstand or misuse science" (p. 422). For the current research, this idea was reflected in participants' comments about stakeholders who will "twist," "catastrophize," or "abuse" research findings or else use them "for their own agenda." This distrust of stakeholder motives was not present in all interviews, and the participants who did speak about it also tended to report having had negative

experiences with KMb that informed these hesitations. However, none of the participants appeared to suggest that these risks were sufficient cause to avoid engaging in KMb or otherwise limit their engagement with stakeholders. Generally, most participants seemed to have a positive view of KMb and its potential to help people and improve the research, even those who admitted to having reservations about the process. This is a departure from past findings that some researchers may have negative outlooks on KMb and even express hostility toward the process (Davies, 2008; Simis et al., 2016). Many participants in the current research also expressed an openness to learning more about KMb best practices and techniques, suggesting that the introduction of training and other professional development opportunities may be a viable way to improve the effectiveness of college KMb.

The literature has also been clear about the existence of a communication gap between university researchers and their non-academic stakeholders due in part to institutional factors. Phipps and Shapson (2009) said that “Almost all academic institutions still lack the capacity to support research utilisation” (p. 215) and identified the fact that there is “little academic reward for engaging in activities that enhance non-academic research impact” (p. 223). Among Cooper et al.’s (2018) boldest findings was that “KMb is not well aligned with the priorities of academia” (p. 4), since the university researchers in that study reported being under immense pressure from their institutions to produce academic publications at the expense of more strategic, targeted KMb initiatives toward non-academic stakeholders. By contrast, a consistent refrain from participants in the current study was relief that they did not need to contend with a “publish or perish” mindset. Thus, the high-pressure publishing environment that seems to create barriers for university researchers does not seem to negatively affect college-based KMb. Participants who had professional experience in both university and college settings generally

compared the college experience favourably in this regard. While participants acknowledged that non-academic KMb products might not always enjoy the same standard of rigour as a journal publication, they also pointed out that there were ways to apply rigour to these knowledge products outside of the conventional academic infrastructure. Many participants also reported that they continued to publish academically and present at conferences even without formal incentives or imperatives from their institution. At colleges, the lower institutional expectations to publish academically seemed to make participants feel “free” to pursue KMb strategies that suited them and their partners’ needs, resulting in positive KMb outcomes and supporting past findings that “publish or perish” may be counterproductive to effective KMb (Cooper et al., 2018). It is important to note, however, that although colleges did not seem to *discourage* non-academic KMb, participants also did not report experiencing any professional incentives to engage in the activity. The perception of participants seemed to be that colleges “don’t really care if we publish.” Although the introduction by institutions of academic or professional rewards for non-academic KMb can seem a tempting prospect, it runs the risk of introducing a parallel but equally unproductive “publish or perish” mindset in the college world where the publishing objectives merely shift direction. The college environment’s low pressure to publish academically may be considered a facilitator of college-based KMb.

Because the make-up of research funders in the college system are complex and varied, different participants reported experiencing different kinds of funder-related barriers to KMb success. For participants whose work was primarily in partnership with non-profits and community-based organizations, the main barrier seemed to be that partners usually lacked resources to contribute substantially to the research and KMb. Participants whose partners were primarily private sector instead had to contend with the complexity introduced by the dual

partner/funder role. Although we tend to hope that truth is compatible with industry interests, participants reported issues of research integrity occasionally arising in these situations. The heavy influence of industry on research outcomes and the pressure some researchers may feel to produce results that conform to partners' preconceived ideas present a fundamental challenge to the integrity of college research outcomes. It may be worth exploring ways for Tri-Council and other public research regulators to separate the interests of the industry funder from academic researcher, perhaps by placing a cap on industry contributions to a project or by enshrining researchers' rights to academic freedom in funder policies.

Intellectual property (IP) also emerged as an unexpectedly salient barrier for college researchers. Concerns about KMb delays caused by legal review, IP-related limitations on the boundaries of KMb, and poor communication between researchers and partners on IP were all raised by the participants as barriers to effective KMb. The nature of partner-centric research makes these kinds of issues an inevitability. However, most participants acknowledged that strong IP agreements developed at the beginning of the project could mitigate many of these issues. Interestingly, perhaps because IP was so often owned and controlled by research partners and not by the researchers themselves, few participants discussed the challenges or benefits of managing their own IP. The CCI program makes explicit mention of commercialization in its program description; one of its objectives is "[to support] applied research and collaborations that facilitate commercialization" (NSERC, 2020b, para. 7). Yet the only participant who spoke about commercialization in any depth did so to discuss the lack of available support for commercialization research. Most college researchers do not seem to be thinking of commercialization as an activity they can take on themselves or on behalf of their institution, but rather as an industry-led process supported and facilitated by researchers. If they do pursue



commercialization with the goal of creating a spinoff company or commercializing a college-owned product or service, they may not find many internal or external resources to help them achieve it. This may suggest that stronger systemic resources are needed to support college researchers in branching out to manage their own intellectual property, especially as product commercialization and spin-off companies are becoming such an important success metric for many colleges.

When considered in context with the literature and in light of the original research questions, participant insights painted a detailed picture of college-based KMb in Canada. Although many participant responses echoed previous findings on researcher perceptions of KMb (e.g. continued adherence to knowledge hierarchies), others challenged previous findings and contributed novel insights, such as the idea that a lack of “publish or perish” culture in Canadian colleges facilitated more targeted and productive KMb. Before summarizing key takeaways and recommendations for future research in the **Conclusion** section, I will briefly address some important limitations of this study.

### **Limitations**

Like all research, this thesis has limitations that must be considered when engaging with the findings. Firstly, when recruiting participants, I was limited by the relatively small population of CCI funding recipients within the province from 2016–2020. As discussed in the **Selection and Recruitment** section, I relied in part on snowball sampling, which occurred when participants referred me to other researchers in their peer group whom they thought might consent to an interview. While this choice ensured that I could recruit enough participants for my dataset, it also meant that some of the participants knew and had occasionally worked with each other, likely sharing a few common experiences and perspectives as a result. However, even

participants who ostensibly had similar professional experiences with KMb still offered vastly different insights. The interviews did not suffer from a lack of diversity in opinion or experience.

Another potential limitation involves the choice I made to introduce participants to a working definition of KMb early in the interview, rather than letting them define the term for themselves in their own words. As acknowledged in the **Discussion** section, this decision may have precluded participants from engaging with the term in ways that defied my pre-set expectations as the researcher. However, this choice ultimately added coherence and consistency to the interviews. Participants represented a diverse range of disciplines, and because the term KMb is commonly used in only a few of them (“knowledge transfer,” “knowledge translation,” and “dissemination” being the most popular alternatives, all of which have slightly different meanings and connotations), it was helpful for consistency’s sake to begin all interviews with a common understanding of the term. Introducing the working definition allowed participants to understand my meaning quickly when we discussed KMb, and inviting participants to modify the definition rather than create their own gave them a starting point, encouraging creative additions and substitutions that may not have occurred otherwise.

This research also explored the research environment of colleges in only one Canadian province. Post-secondary applied research regulations and mandates differ significantly from province to province. A more comprehensive investigation of the factors influencing KMb in multiple Canadian provinces and which includes other non-university institution types (such as the CÉGEP system in Québec) would help answer the question of how these insights can be viewed and interpreted in other jurisdictions.

Although this area of research could include a range of perspectives, I have focused here on the researcher perspective, as researchers are the primary drivers of KMb and retain most

responsibility for its outcomes. However, given that the assumptions of this thesis include the fact that researcher knowledge and perspectives are frequently over-privileged at the expense of other viewpoints, it is critical that future research elevate the perspectives of non-researchers as well. Of especial importance are the research partners, the primary stakeholders who are the main intended beneficiaries of the research and who frequently support research proposals, write letters of support, and are involved in methodology development and data collection. These perspectives should be prioritized in future research on this topic.

### **Conclusion**

KMb enriches Canadian research ecosystems and helps to answer growing calls for accountability in publicly funded research. Broad consensus exists among researchers, funders, and other stakeholders that KMb is a valuable undertaking, but disagreements remain about how best to support it. This thesis has examined KMb in college-based applied research, asking how researchers define and understand KMb while also exploring the various barriers and facilitators that affect KMb in the college context. Existing literature demonstrates that, although co-creative, co-constructed, democratized KMb remains one of the best-evidenced approaches to effective KMb, researchers and institutions do not always act consistently with this ideal, sometimes due to personal beliefs about KMb and sometimes due to a lack of resources. The literature also revealed a range of barriers to KMb, including high-pressure publishing environments and a lack of time, funding, and other resources needed to carry out KMb.

Using qualitative interviews and thematic analysis, I derived several key insights about the way KMb functions at Canadian colleges. When defining KMb, participants generally agreed that KMb is a complex, reciprocal, and continuous phenomenon with potential to elevate their field, solve problems, and inform important decisions. It was also characterized as an emergent

phenomenon that frequently happens at the initiation of stakeholders and without planning on the part of the researcher, suggesting a need for researchers to adopt a flexible approach, seizing unanticipated KMb opportunities as they arise. Many participant responses also seemed to reinforce traditional knowledge hierarchies that privilege scientific knowledge above other knowledge types.

Key facilitators of KMb identified by the participants included low professional pressure to publish academically, funding structures that incentivize effective and ongoing KMb, and strong collaborations with other college departments, especially communications and marketing. The CCI research funding program places a heavy emphasis on industry- and community-partnered research, perhaps encouraging a positive view of KMb among researchers and creating natural opportunities and incentives to engage with stakeholders. Barriers to KMb included challenges to academic freedom raised by relationships with private research funders, long delays caused by institutional oversight of KMb, and certain gaps in funding opportunities (insufficient opportunities for course release, low flexibility for funded KMb plans, and lack of funding specifically to support multimedia KMb initiatives).

Future research in this area must prioritize the perspectives of non-researcher stakeholders involved with college-based research. Stakeholders are the ultimate judges of the success or failure of a KMb initiative, and it is critical to understand how stakeholders experience and engage with applied research. Of especial importance are the private sector and non-profit partners of college-based research who contribute resources and expertise to project outcomes and who are the primary intended beneficiaries of the research. Future research should also consider the influence of various provincial regulations and mandates over college research. For example, the CÉGEPs of Québec are active in research but have unique funding and managerial

structures; these and other non-university institutions throughout Canada should be considered in this conversation.

Colleges are the backdrop for some of Canada's most innovative applied and technical research. As unique research environments, colleges present their own range of challenges and opportunities for researchers undertaking KMb. The findings of this thesis demonstrate the importance of including multiple perspectives from Canada's post-secondary research system to understand and support KMb. Embracing complexity in KMb can help create fertile research environments that support social and economic growth. Thus, making space in the discourse for the vital applied research contributions of non-university institutions is critical as research in this area continues to develop.

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### Appendix A: Interview Guide

#### Research Questions

How do college researchers understand the value and purpose of KMb?
What are the main barriers to effective KMb in the college context?
What are the main facilitators of effective KMb in the college context?

#### Pre-Interview Guide

1.	Welcome and introductions
2.	Boilerplate information about the research purpose and objectives
3.	Quick overview of informed consent information and option to review analysis reports
4.	Do you have any questions for me before we begin?

#### Questions

1. How long have you been with *x institution*?
  - a. Describe your current role?
2. Can you give me some details about your area of specialization?
  - a. What do you enjoy about that?
3. In your current role, what percentage of your work time would you say you dedicate to research?
  - a. If asked for clarification:
    - i. In an average workweek, how much time do you spend on research versus teaching, unrelated administrative duties, committee work, etc.?
    - ii. “Research” includes field and lab work, analysis, report writing, hiring and supervising research assistants, stakeholder meetings, administrative work required to make research happen (scheduling, planning, grant writing, etc.); Not just direct research work but all the background work as well.
4. Can you describe your role(s) in the research you’ve worked on in the past five years?
5. I will read you my working definition of KMb, and I am curious to know what you think of it:
  - i. *KMb is the process by which researchers engage with their stakeholders (research partners, collaborators; the scholarly community; students; knowledge end users, etc.). It can take place before, during, and after their research.*

*Examples include stakeholder meetings, public presentations, social media campaigns, workshops, and publications.*

- ii. Do you agree with this definition? Is there anything you would add or take out?
6. Are you or is someone on your team doing KMb activities as part of your current research?
  - a. If not: Do you plan to?
7. How often do you engage with *non-academic* stakeholders about your research?
  - a. If asked for clarification: “Non-academic” includes any stakeholders who are not your academic peers; intended knowledge users, policy-makers, the media, or students all count.
  - b. What strategies work best with non-academic stakeholders?
  - c. What gets in your way of doing KMb more often?
  - d. Prompt for examples
8. Do you ever actively seek feedback on your research from your non-academic stakeholders?  
(e.g.: industry partners, Indigenous groups, wider community publics, etc.)
  - a. Tell me about that? / How often? / when?
9. What do you think are the **benefits** of engaging in KMb?
10. If any, what do you think are the **risks** of engaging in KMb?
11. Does your institution offer supports for researchers in doing KMb? (e.g., administrative support, internal funding, etc.) Describe them?
  - a. How easy or difficult are they to access?
  - b. What could your institution do that would help?
12. Anything to add?