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Brokering Knowledge Mobilization Networks: Policy Reforms, Partnerships, and Teacher Education

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Abstract:
Educational researchers and policy-makers are now expected by funding agencies and their institutions to innovate the multidirectional ways in which our production of knowledge

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can impact the classrooms of teachers (practitioners), while also integrating their experiential knowledge into the landscape of our research. In this article, we draw on the curriculum implementation literature to complicate our understandings of knowledge mobilization (KMb). Policy implementation, we suggest, can be understood as one specific type of KMb. We draw on different models for KMb and curriculum implementation and develop a relational model for KMb. Utilizing our model we critically reflect on the specific successes and challenges encountered while establishing, building, and sustaining the capacity of our KMb network. Our findings suggest that faculties of education are uniquely positioned to act as secondary brokers for the implementation of policy reforms within public education systems. To this end, we discuss how a relational KMb network is a "best practice" for establishing and sustaining partnerships among policy makers, educational researchers, and public school practitioners.
Keywords: curriculum implementation; global citizenship; teacher education; knowledge mobilization; professional learning communities

Facilitando la movilización de conocimientos en redes: Reformas políticas, asociaciones y la formación del profesorado

Resumen: Los organismos de financiación y sus instituciones esperan que investigadores educativos y responsables de decisiones políticas en el área innoven la forma multidireccional en la que la producción de conocimiento puede afectar a las aulas de los docentes, y al mismo tiempo integrar su conocimiento experiencial en el modelo de la investigación. En este artículo, nos basamos en la literatura la implementación del currículo de reflexionar sobre nuestro entendimiento de la movilización de los conocimientos (por su sigla en inglés KMB). La implementación de políticas, se sugiere, se puede entender como un tipo específico de KMB. Nos basamos en diferentes modelos para la aplicación KMB e implementación curricular y desarrollamos un modelo relacional para KMB. Utilizando nuestro modelo reflexionamos críticamente sobre los éxitos y desafíos específicos encontrados mientras se establece, la construcción y el mantenimiento de la capacidad de nuestra red de KMB. Nuestros hallazgos sugieren que las facultades de educación están en una posición única para actuar como agentes secundarios en la implementación de reformas de política dentro de los sistemas de educación pública. Con este fin, se discute cómo una red KMB relacional es una "mejor práctica" para el establecimiento y mantenimiento de alianzas entre responsables políticos, los investigadores de la educación, y los profesionales de las escuelas públicas.
Palabras clave: la implementación del currículo; ciudadanía global; profesor de educación; movilización de los conocimientos; comunidades de aprendizaje profesional

Facilitando a mobilização de redes de conhecimento: as reformas políticas, parcerias e formação de professores

Resumo: Agências de fomento e instituições de ensino esperam que os pesquisadores em educação assim como os que decidem políticas na área inovem na forma multidirecional que a produção de conhecimento na pode afetar o professor em sala de aula, e ao mesmo tempo integrar os conhecimentos experienciais no modelo de pesquisa. Neste artigo, nós confiamos na implementação do currículo literatura para refletir sobre a nossa compreensão da mobilização de conhecimentos (a sigla KMB). Implementação de políticas, sugere-se, pode ser entendida como um tipo específico de KMB. Contamos com diferentes modelos de candidatura e curriculum implementação KMB e desenvolver um modelo relacional para KMB. Usando nosso modelo, para refletir criticamente sobre os sucessos e desafios específicos encontrados ao estabelecer, construir e manter a capacidade de nossa rede de KMB. Nossos resultados sugerem que as escolas de educação estão em uma

posição única para atuar como agentes secundários na aplicação de reformas políticas no seio das redes públicas de ensino. Para este fim, discutimos como uma rede relacional KMB é um "melhores práticas" para a criação e manutenção de parcerias entre os que decidem políticas, investigadores e profissionais de educação nas escolas públicas.
Palavras-chave: implementação do currículo; cidadania global; formação de professores; mobilização de conhecimentos; Comunidades de Aprendizagem Profissional

Introduction

> How is curriculum implementation conceived of in dominant ways of understanding it? What is the mainstream perspective that allows this kind of understanding? Within this perspective how is the teacher engaged in implementation viewed? (Aoki, 1983/2005, p.112)

As we make our way into this second decade of the 21st century, more and more provincial public schooling systems are faced with the complex task of preparing their citizens for the local, national, and global demands of a knowledge driven digitalized economy. School boards and their differing programs must now "act as micro-level sites of curriculum reform that refract macro-level ideas about social and technological transformation" (Williamson, 2013, p. 2). Theories of curriculum implementation, teaching, and learning within and for a digital knowledge economy are saturated with what Williamson calls "cybernetic" metaphors for mobilizing information like "networks, nodes, dynamics, flexibility, multiplicity, speed, virtuality, and simulation" (p. 4). Conceptualizations of curriculum policy and its implementations must respond, as Williamson makes clear, to "a vision of the future of education and learning that is decentered, distributed, and dispersed rather than narrowly centered, channeled, and canalized" (p. 4). Responding to these global demands, the Ontario Ministry of Education has called for university researchers, school boards, principals, and teachers to develop strategic pilot projects that will examine the shifting landscape of learning environments across different provinces in terms of developing and implementing several different policy reforms.

In light of this rapidly evolving landscape, educational researchers can no longer operate exclusively within universities as silos, who work only to publish their research in academic journals for their respective colleagues. Instead, educational researchers and policy makers are now expected by funding agencies and their institutions to innovate the multidirectional ways in which our production of knowledge can impact the classrooms of teachers (practitioners), while also integrating their experiential knowledge into the landscape of our research. Or, what we are calling a relational model of knowledge mobilization.

Creating, implementing, and supporting knowledge mobilization (KMb) plans is a practice that is widely embraced in medicine and health services. However, establishing strong links between research, policy and practice has been more difficult to facilitate within educational research (Hemsley-Brown & Sharp, 2003). Here Cooper (2013) reminds us: "Part of what makes KMb so challenging is that its success is predicated upon linkages and connections *between* and *within* diverse organizations" (p. 191). In this article then, we critically reflect on our experience building a KMb network to conceptualize and propose a relational model of knowledge mobilization, which in turn afforded us an opportunity to make sense of highly complex interactions within and between *people & practices*, *places & procedures*, and *policies & publications*. Concomitantly, we suggest that Faculties of Education are well positioned to act as KMb brokers through developing sustained purposeful

collaborations with teachers that support knowledge creation and mobilization by researchers and practitioners.

As research on "best practices" for KMb enters new sites, such as schools, it collides with factors such as personal attitudes, public expectations, political biases, resource constraints and conflicting information (Burns & Schuller, 2007). Increasingly, this has led certain educational researchers to move away from simple top-down models toward exploring the complex ways knowledge migrates within and across different sites of teaching and learning (Aoki, 1983/2005; Louis, 2010). In terms of curriculum policy implementation, Honig (2006) has put forth a conceptual model, which attempts to address such complexity within and between sites. She situates our potential understanding of such complexity as interactions between *people*, *places*, and *policies*. We have adapted her model to discuss our Faculty of Education's collaborative KMb efforts with the Ministry of Education, local school boards, teachers, and students.

In taking up the idea of KMb in our practice and our research, we adopt the definition put forward by the Social Sciences and Humanities Research Council (SSHRC, 2009, 2010):

> "Knowledge mobilization" refers to a range of processes that help move research results into society, as well as bring new ideas into the world of research. From knowledge-brokering and outreach, to more effective dissemination through new technologies, to the "co-creation" of knowledge, these processes help ensure that public investments in social sciences and humanities research have the greatest possible impact—intellectually, socially and economically. (p. 12)

An important aspect of this definition is that knowledge mobilization is not presented as *unidirectional* (official research knowledge moving from universities toward schools), but *multidirectional*, involving the movement of both academic and professional knowledge between multiple partners and sites. As such, there are important areas of overlap between research, KMb plans, and curriculum implementation.

Our research began in 2011, when we received a grant through the Knowledge Network for Applied Education Research (KNAER) (see www.knaer-recrae.ca) that enabled us to develop and extend a KMb network with two local school boards. The resultant *Mobilizing A Global Perspective with Educators: Curriculum, Equity, and Community Partnerships* project sought to establish reciprocal school/university partnerships for the development and implementation of curriculum which enabled teachers, researchers and teacher candidates a unique opportunity to both generate and share knowledge that can then collectively contribute to knowledge mobilization (KMb). The specific goals of the KNAER funding worked toward enhancing various intermediaries' capacities by:

1. Exploiting available research more effectively;
2. Building or extending networks for further research in priority areas;
3. Strengthening research brokering work; and
4. Visits by world leading researchers.

In response, our project sought to focus on "best practices" for curriculum policy implementation as well as building or extending networks for further research within these priority areas. With this funding, we fostered a network of professional learning communities (hereafter PLCs), comprised of school administrators, classroom teachers, teacher candidates and teacher educators, in order to explore the process of implementing curriculum reforms as action (research) projects in their respective schools and/or communities, through a collaborative-inquiry and place-based approach.

Moreover, several of the Ministry of Education priority areas—including but not limited to collaborative partnerships, student engagement, diversity and equity, as well as environmental sustainability—were integrated into the work of the PLCs.

Part of our research sought to understand our role in establishing, developing, and sustaining this relational KMb network specifically as a *knowledge broker*. As Jackson (2003) stresses, an educational knowledge broker "is a proactive facilitator who connects people, networks, organizations and resources and establishes the conditions to create something new or add value to something that already exists" (as cited by Cooper, 2013, p. 183). In organizing and co-facilitating our KMb network, this is very much the role we took on. However, our position must also be understood in relation to KNAER and its respective mobilization initiatives. Cooper (2013) situates "the term research brokering organization (RBO) to describe third party intermediaries whose active interaction between research producers and users is a catalyst for increased KMb and research use in the education sector" (p. 185). KNAER was founded as a partnership between the Ontario Ministry of Education, University of Toronto, and Western University to broker, "facilitate and lead the spread of established and new evidence through networks across Ontario's policy, education and research communities, and connects with national and international networks" (Ontario Ministry of Education, 2010, p. 1). Like Cooper, we understand KNAER to be an RBO. The active interactions between research producers and users has been partially delegated by KNAER to its funding recipients, who are tasked more directly with building, enhancing, and sustaining relationships with their KMb partners. Such relationships create another level of intermediary—self-directed, but operating under the purview of a larger RBO. Brokering our network situated us as a *second-level knowledge broker*, operating under the purview of KNAER.

Amanda Cooper and her colleagues have sought to understand the larger context and implications of differing KMb strategies inside and outside the field of educational research across Canada. In a review of the use of research, Cooper, Levin, and Campbell (2009) called for universities and educational researchers to enhance their capacities for innovating different KMb strategies as part of their larger research programs. To this end, we need to be "more active at KM our work" (p. 169). As part of her research, Cooper (2014a) evaluated different institutional websites for evidence of KMb efforts, especially the use of their products, events, and networks. According to her findings, faculties of education performed well in terms of developing products and events, but quite poorly in terms of establishing, developing, and sustaining KMb networks. Cooper (2014a) notes:

> The sparse evidence that does exist seems to suggest that product strategies are potentially less powerful avenues for practice change than face-to-face interaction and professional networks, especially if they mimic passive dissemination strategies of the past. If more evidence reinforces the initial trends, a shift will be needed away from merely tailoring products and posting them online towards building more robust and sustainable KMb networks. (p. 49)

What exactly such "robust and sustainable KMb networks" would look like remains to be explored.

The connections we make here between research on KMb and on curriculum implementation are valuable for the following reasons. First, research on curriculum implementation has a long history, which can enrich our understandings of the emerging field of KMb research. Secondly, KMb research provokes us to rethink the traditional governmental processes for implementing curriculum policy reforms. In fact, curriculum implementation can be understood as one specific strategy for establishing and sustaining school partnerships that work collaboratively to share educational research as part of their larger strategic KMb action plans.

In what follows then, we utilize a relational KMb model to critically reflect on the *Mobilizing A Global Perspective with Educators: Curriculum, Equity, and Community Partnerships*, which involved both the mobilization of researcher and practitioner knowledge and the implementation of specific curriculum policies, in order to improve our capacities—as teacher educators, teachers, and teacher candidates—for citizenship and environmental education. We review the research on KMb to discuss the different models that have been proposed, specifically what have been called *linear* and *interactive* models. We draw on recent research to suggest that each of these approaches capture important aspects of the KMb process, and that both should therefore be taken into account. In the next section we situate a conceptual model of KMb that combines elements of both linear and interactive models through critically reflecting on our lived experience as brokers facilitating a KMb network. To do so, we build on the work of Honig (2006) to propose what we call a *relational model of KMb*. We then use this model to discuss the developmental process of our KMb network, presenting evidence from our internal program review that indicates the successes and challenges we faced. Moreover, we suggest that knowledge generated through the purposeful collaboration of researchers, school administrators, teachers, and teacher candidates in research and professional practice can be mobilized to inform the work of teachers, researchers and policy makers. In the last section, we suggest how Faculties of Education have the potential to act as important brokers in educational KMb, as is evidenced by the KMb efforts of other Canadian Faculties, including York University and Memorial University (Cooper, 2014a). In this regard, we propose some potential implications for teacher education with specific consideration given to the newly extended (four semester) bachelor of education, which will be implemented in Ontario in 2015–2016, and draw particular attention to how our KMb network can act as a model for future teacher education.

Mobilizing Trends: PLCs, KMBs, and RBOs

> KMb occurs through iterative, social processes involving interaction among two or more different groups or contexts (researchers, policy makers, practitioners, and third party agencies, community members) in order to improve the broader education system. (Cooper, 2014a, p. 29)

As Cooper (2013) points out: "While there is very little empirical work exploring KMb across sectors, it is especially sparse in education" (p. 182). Therefore, in reviewing the literature on KMb here, we supplement it also with a more fully developed literature on curriculum implementation. Similar to the KMb literature, research on curriculum implementation over the last several decades has moved gradually from a direct and linear model of transmission to more embedded and interactional models of organizational change (Fullan, 2005), in which the network of relationships within an individual school, rather than district-level policies, becomes the primary focus in educational change (Goldspink, 2007). Indeed, as we discuss in the next section, curriculum implementation can be understood as one specific type of KMb—involving the transfer of knowledge from Ministry and school board publications into the organizational procedures and individual practices of school administrators and classroom teachers.

Central to the literature in both KMb and curriculum implementation has been the research on organizational learning. While the organizational learning processes necessary for a school to adopt new knowledge were originally conceived as fairly unproblematic, recent research has demonstrated how complex the process of situating *meaning making* actually is (März & Kelchtermans, 2013). Spillane, Reiser, and Gomez (2006) have indicated three main ways in which messages can be misinterpreted at the point of delivery: 1) They can be interpreted multiple ways by

different people; 2) They can be received merely as a new phrasing of an existing idea; or 3) They can be understood superficially without being applied to practice. However, according to Fernandez, Ritchie and Barker (2008), the process of implementing new curriculum policies remains an interpersonal endeavor, where people work in a specific context and in turn must figure out how to transform disciplinary and political texts into practice.

While PLCs are a commonly recognized as a "best practice" for fostering this collaborative interpersonal learning process (e.g. Dufour & Mattos, 2013), they can too easily devolve into regimented meetings of like-minded colleagues and simply reinforce the status quo (Printy, 2008). In this sense, our use of PLCs to research the collaborative implementation of curriculum policy reforms is guided by Leithwood and Louis' (2012) contention that PLCs are better understood as "organic configurations of trusting relationships among teachers" focused on solving shared problems (p. 231). According to Earl and Hannay (2011), a key element in this process is to bring together a range of people with different experiences and assumptions. By working respectfully with each other through these differences, the members of a PLC can make their tacit professional knowledge more explicit so that it can be acted on to enable meaningful change. As multiple stakeholders in the KMb process are incorporated into such conversations, the productive power of teachers and teacher candidates as "co-creators" of new knowledge—and, we would add, self-understanding (Ng-A-Fook, 2015)—can be better leveraged to enact meaningful dialogue and change in relation to curriculum reform (Datnow & Park, 2010).

Turning explicitly to the literature on KMb, Landry, Amara, and Lamari (2001) provided an initial mapping of the KMb landscape across the social sciences in Canada. They conducted a survey of social science researchers (in social work, industrial relations, economics, political science, anthropology and sociology) in order to compare four existing models of research use—the "science push model," the "demand pull model," the "dissemination model," and the "interaction model." While these four models move progressively from a simple top-down approach to a more interactive one, Landry, Amara, and Lamari conclude that none of these models sufficiently embody the complex and contextual nature of knowledge mobilization that their findings reveal. Hemsley-Brown and Sharp (2003), in a systematic review, also emphasize the contextual dimensions of mobilizing educational and medical research. The literature they review suggests two key conceptual limitations with the traditional models put forth by Landry, Amara, and Lamari. First, while the models become progressively more interactive, they nonetheless are *linear*. Secondly, while they promote an interactive role for practitioners, they continue to assume that knowledge creation only *occurs* through research. Instead, Hemsley-Brown and Sharp conclude that KMb can be understood as situated organizational change, and that the emphasis should be on fostering organizational cultures that value learning. They suggest, furthermore, that the highly contextualized nature of KMb is particularly important for the social sciences, in which research findings are not generalizable in the same ways as in medicine—where KMb has been more generally embraced.

Cordingley (2008) provides an expression that perhaps fits best with our contextual or non-linear understanding of KMb in education. She presents researchers' and teachers' knowledge as of two different (but equally valuable) types: "Researchers uncover the complexity of learning and make it explicit. Practitioners experience the complexity of learning and strive to make it simple enough to shape the next steps in learning" (p. 44). Therefore, teachers' knowledge is complex and situated, derived from a range of experiential and theoretical sources. Within this conceptual framework, "professional learning is conceived not as a question of communicating knowledge but as a question of orienting knowledge from one sphere so that it can be organized and framed in another—to support specific learning needs for target groups of students and their teachers" (p. 46). Here, professional learning is thus achieved through an ongoing interactive process in which

researchers' and teachers' knowledge are equally valued and focused on understanding and responding to particular situated—curricular and pedagogical—challenges. Cordingley's framing of professional learning, however, draws increasing attention to a need for building strong connections among these different knowledge-generating contexts, so that our interactions across different sectors can enable the mobilization of professional knowledge. RBOs, as Cooper (2013, 2014a, 2014b) maintains, play a key role in both establishing and sustaining KMb networks.

In her research on RBOs, Cooper (2013) conceptualizes the gaps within and between educational organizations as "white space," a term drawn from the visual arts and indicating the blank spaces between identified units of meaning. She explains:

> The oft-cited gaps that occur between research, practice and policy happen in the white space of the education system: between universities, funding agencies, ministries of education, school districts, schools, professional associations, community organizations and the many other organizations which comprise the broader system. (p. 190)

Cooper therefore sees a primary role of RBOs as establishing, developing, and sustaining connections within and between organizations that can identify and narrow these gaps. RBOs play a central role in creating and sharing professional knowledge that attends to the lived experiences of teachers and students.

Other research questions the extent to which linear models of KMb have been dismissed, and instead call for more balanced approaches (Louis, 2010; Nutley, Jung, & Walter, 2008). These scholars point to the fact that linear KMb models remain the soup du jour—and often, with measurable success. "On the one hand school improvement depends," as Louis (2010) stresses, "on the implementation of new ideas" (p. 3). Whereas "on the other the refinement of theories about knowledge use," she continues, "depends on having schools that serve as natural loci of experimentation and change" (Louis 2010, p. 3). The call for a more balanced approach is also present within the curriculum implementation literature, where prominent scholars like Michael Fullan (1999, 2010), for instance, has moved from a decentralized and interactional model to the re-incorporation of certain "top-down" implementation measures. We might be tempted to see educational trends therefore as vacillations. However, we suggest that they can be understood through the dialectical model Vygotsky (1978) adopts for human learning, or John Dewey (1900, 1902) before him, in which new forms of knowledge are gradually incorporated into our understandings of lived experiences. We contend that all educational change happens through such iterative and recursive relationships.

Therefore, while linear and top-down approaches are necessary for certain—cultural, educational, institutional, social, and so on—contexts, they have respective limitations with regards to establishing, developing and sustaining the complexity of relationships between administrators, teachers, and students. Top-down models hold a specific, situated, and limited contextual place in any proposed relational model for mobilizing knowledge, curriculum implementation, and/or organizational learning. Here, Nutley et al. (2008) suggest that linear and interactional approaches should be undertaken side-by-side as two complementary perspectives. To do so, they draw three models of KMb from the social work field to bridge these two broad perspectives: 1) The research-based practitioner model (a "bottom-up" individual initiative); 2) The embedded research model (a "top-down" policy dissemination); and 3) The organizational excellence model (interactive and situated forms of learning).

Louis's (2010) research, offers a nuanced understanding of what a hybrid linear-interactional model might look like. We read her work through the following three key points. First, knowledge should be understood as localized in particular peoples' practices, without discounting the unpredictable movement of knowledge between sites. In this sense, research is just one kind of knowledge and concomitantly must be negotiated in relation to the situated knowledge of practitioners. Second, the main obstacle to knowledge mobilization is the lack of bureaucratic flexibility within organizations either as individuals and/or an organizational culture, such as but not limited to superintendents, school administrators, parent committees, and/or teachers. Finally, because of the complexity of organizational change, Louis specifies that knowledge mobilization should be evaluated through longitudinal studies. This means that knowledge mobilization must be embedded within a "sustained interactivity" over a long period of time. Establishing and supporting the interaction of various stakeholders should therefore be balanced between networks of close colleagues (who build a foundation of trust but also tend toward reifying the status quo) and external stakeholders (who can disrupt the assumptions that can take hold within a closed system). We will be drawing on the conceptual ideas put forth in this body of research as we introduce a relational model for curriculum implementation and KMb in the next section.

Reconceptualizing our Praxis for KMb: Linear, Interactional, and Relational Models

> Implementation research should aim to reveal the policies, people, and places that shape how implementation unfolds and provide robust, grounded explanations for how interactions among them help to explain implementation outcomes. The essential implementation question then becomes not simply "what's implementable and works," but what is implementable and what works for whom, where, when, and why? (Honig, 2006, p. 2)

There are various conceptual and pragmatic limitations with simple linear models, which do not always account for the complex and multidirectional movements of knowledge. An alternative to a linear model is an embedded model, in which a series of concentric circles display the levels of context from the individual practitioner outward. However, as Datnow, Hubbard, and Mehan (2002) demonstrate, an embedded model is still fundamentally linear. It does not afford, at least representationally, for direct interaction between circles that are not immediately adjacent. Such a model still assumes that there is only one line along which knowledge can move, albeit in complex and iterative ways.

Working in the realm of educational policy implementation, Honig (2006) has developed a model that we believe addresses some of the conceptual concerns we had in terms of our project. She represents policy implementation as an equilateral triangle, with *policies*, *people*, and *places* positioned at the three points and interacting in varied ways. Here Aoki (1983/2005) reminds us that, "doing curriculum implementation is achieving a deep understanding of curriculum X and transforming it based on the appropriateness to the situation" (p. 118). Or, what he called more than 30 years ago *curriculum implementation* as a *situational praxis*. In this sense, Honig, much like Aoki before her, is not presenting an absolute framework that could be mapped onto every contextual aspect of a situation. Rather, this model is a heuristic device that can be used to situate, analyze, and understand the interrelations in specific instances of policy implementation. Significantly, it can be used for mapping simple linear movements of knowledge as well as complex interactive and relational processes. Therefore, we have adapted it here as a potential conceptual model for

analyzing KMb strategic plans related to curriculum policy implementation research. In this sense, we have "expanded" it, to reconsider the various ways in which KMb can be understood as a broader category that encompasses curriculum implementation. In this regard, any instance of curriculum implementation can also be understood as the mobilization of specific forms of knowledge, embedded in government offices and policy documents, into the situated learning environments of particular organizations and their respective professional educators.

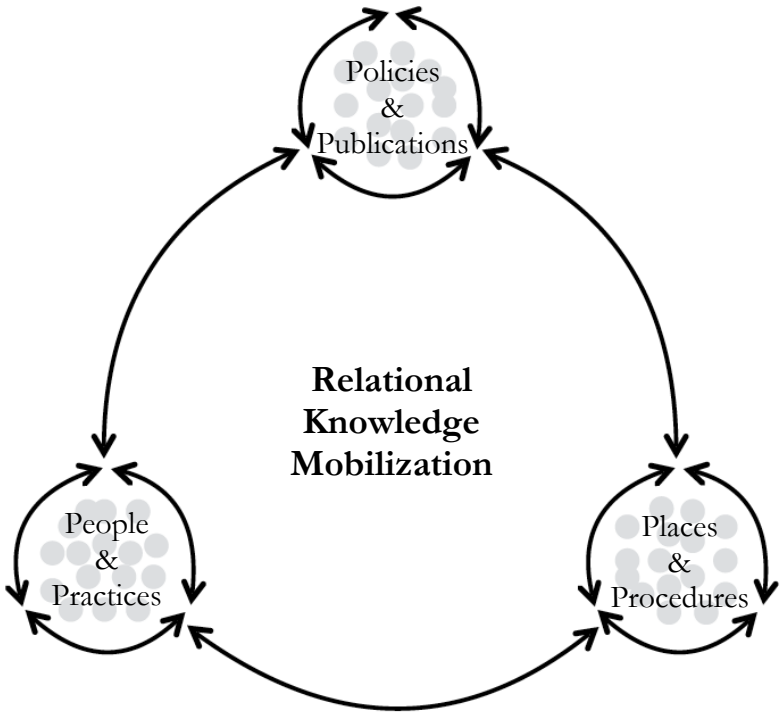

Figure 1. A relational model of knowledge mobilization.

As depicted in Figure 1, we have expanded Honig's (2006) categories here to *People & Practices*, *Places & Procedures*, and *Policies & Publications*. These categories should be understood not as unitary items but as clusters of particular entities with varying interconnections. Each of these categories often function as a closed loop; recognizing that knowledge often mobilizes more easily *within* one of these categories than *between* them. For instance, particular ideas can be referenced back and forth between academic publications and government policy without ever entering into the school board policy procedures or teacher's individual practices. Similarly, the formation of organizational fields can cause similar procedures to be adopted across many places without responding to the requirements of local policy or practice (Louis, 2010). However, there will also always be disconnections or "white spaces" within the categories (Cooper, 2013). This is why brokering the mobilization of knowledge between the categories is so important.

In terms of their relational interactions, these categories can be understood through Nutley et al.'s (2008) three complementary models of knowledge mobilization. In this sense, the *People & Practices* category represents a research-based practitioner model, which encompasses more individualistic approaches to acquiring or disseminating knowledge. Whereas, the *Places & Procedures* category represents an organizational excellence model, which encompasses more interactional models based on organizational learning. And, the *Policies & Publications* category represents an

embedded research model, which follows a more traditional linear model of embedding knowledge in documents taken up later by different people in different places. Building on the research of Nutley et al. (2008) and Louis (2010), we treat interactional and linear models as complementary aspects of a more complex and interconnected relational model. While this model could be applied within a more limited scope (e.g. within one school), it is designed to describe the kind of complex network we were involved with, including a range of people and their practices across a range of organizations and their procedures, interacting with a range of policies and publications. In the ensuing sections we utilize this *relational* model of KMb to describe our lived experiences with organizing a KMb network among our faculty of education, local school boards, and local elementary schools through the *Mobilizing a Global Perspective with Educators: Curriculum, Equity, and Community Partnerships* project.

Mobilizing a Global Citizenship Perspective with Educators: A KMb Network

> Good teachers are expected to make reasoned curriculum decisions and to be able to defend their actions. Without some knowledge of the directions and relative strengths of forces influencing their profession, they cannot expect to achieve professional autonomy. (Connelly & Clandenin, 1988, p. 98)

National and provincial funding agencies across Canada have increasingly drawn attention to KMb as a key priority area (e.g. SSHRC, 2009, 2010). As their revised policies make clear, we have a responsibility both to co-mobilize our own research knowledge into the hands of practitioners, and also to co-mobilize practitioners' experiential knowledge into the world of research. However, we also want to stress that this is not a novel idea in terms of "best practices" for doing, mobilizing, and understanding educational research. At the turn of the last century, educational philosophers and researchers like John Dewey were already embedding such kinds of knowledge mobilization within organizations like the Chicago Lab School (Camp Mayhew & Camp Edwards, 1936). In this section then, we outline how KNAER has provided a particularly effective framework that enabled us to enhance our capacity to build and extend our knowledge mobilization network, relationships, and partnership with local school boards.

In 2011, the funding provided by KNAER enabled us to extend our reach beyond student teachers into our partner school boards and school classrooms of practicing teachers. We built upon our existing partnerships with the Ottawa Carleton District School Board (OCDSB) and the Ottawa Catholic School Board (OCSB) to mobilize evidence-based research on curriculum design and assessment, critical pedagogy, and resource development, in order to support teachers in meeting curricular goals around global citizenship in elementary and middle school classrooms. More importantly, we were able to establish *a relational KMb network* of teacher educators, teachers, school administrators, and teacher candidates that disrupted the assumed linear transfer of knowledge from universities to teachers and that served to mobilize evidence-based research, social innovation, and "best practices" across all the sites in our network.

The knowledge mobilized in our network was both *multi-sourced*—research and professional knowledge generated within the practices and procedures of our different people and places—and *multidirectional*—moving fluidly between people and places to mutually enhance our practices and policies. Our role, therefore, was not to control this network in a top-down manner. Rather, as we have suggested previously, we acted as a second-level knowledge broker, operating under the

broader purview of KNAER as an RBO. The project afforded us opportunities to understand the gaps, challenges, and impacts related to facilitating a KMb network among universities and schools.

Collaborating with a superintendent selected by each of the two school boards (public and Catholic), we established steering committees and charted an initial direction. Together we created PLC teams comprised of lead teachers, researchers and teacher candidates. We worked with the OCDSB (14 PLC teams) and the OCSB (9 PLC teams) on curriculum development and implementation action (research) projects, which in turn provided the context to co-create and mobilize research and practice knowledge within and between schools, school boards, and our faculty of education.

This took a different direction with each board, based on their respective priorities. The steering committee for the Catholic board decided to focus on collaborative inquiry as a "best practice" for their schools. This was intended to start with students' interests and then integrate students' interests into social justice practices across the curriculum. The committee had in mind different schools they wanted to work with, so they invited the principals and teachers from those schools directly. They were asked to focus on research projects that they were already engaged with in terms of collaborative inquiry, but then fit them into the focus of the wider project. Nineteen teachers and three principals from nine different elementary schools participated in the project. These were paired with 20 primary/junior teacher candidates from DGPE to form nine PLC teams. These teams embraced a wide range of inquiry-based, awareness and social action projects, focusing on engagement around issues of global citizenship. The final collaborative inquiry projects included looking into children's rights, poverty, global issues awareness, environmental sustainability, Indigenous education, the power of the individual, and racism. The projects utilized the inquiry cycle as a model for student, teacher, and teacher candidate learning, in a way that was open-ended and classroom-directed.

Three full days were dedicated to professional development through presentations, breakout seminars, resource sharing of innovative pedagogy, and case studies to explore existing school projects/models that inspire student engagement around socio-ecological change. The remainder of the project saw PLC teams working co-dependently to develop a wide range of classroom-ready teaching materials and web-based resources to align with the Ontario curriculum expectations and to address goals of current school board programs. Through surveys, interviews, and focus groups, the project was evaluated for its impact on mobilizing knowledge, enhancing teacher confidence and practice, and the collaborative partnership experience with local school boards and NGOs.

Within the public school board, we worked with the superintendent and the curriculum services department. They wanted to focus on the Ontario Ministry of Education's (2009) policy framework for environmental education, and best practices associated with integrating environmental sustainability into teaching and learning across different school programs. They sent out a general call to teachers interested in developing their professional knowledge and/or contributing professional knowledge to integrating environmental sustainability across the curriculum. Nineteen teachers responded to the call, all from different elementary and middle schools. These teachers were then grouped with 35 junior/intermediate teacher candidates from DGPE to form 14 PLC teams. These teams embraced an inquiry-based, community-oriented and/or curriculum social-action-project approach with regards to student engagement around issues of environmental sustainability (see Ng-A-Fook, 2011, 2013; Reis, Ng-A-Fook, & Glithero, 2015). The projects undertaken included units of study on local food security, community walks exploring attributes of healthy communities, and sustainable local economies, ethical consumerism, and character education for engendering agency in youth.

We provided professional development sessions for the PLC teams. These had three areas of focus: building a sense of community and strengthening the network, sharing professional knowledge from invited speakers in the relevant areas of learning, and planning out the scope and sequencing of the project. The PLC teams from both boards then attended professional learning sessions in December 2011 and January 2012. At this point the teams began to develop their projects and had release time (two sessions of four days each) to work on these projects and then implement them with their students. In March we had a final session, at which the teachers and teacher candidates could showcase their learning. The PLC teams set up interactive displays and posters, highlighting the various learning experiences/projects that took place in the schools; this was followed by a debriefing about the entire project, including what worked and what didn't work in terms of establishing, developing, and sustaining our knowledge mobilization network. The teachers, teacher candidates, and graduate students involved in the project then worked to further mobilize the knowledge we had developed through the DGPE website and through newsletters sent out to schools and central offices from both school boards.

As a sample project, one PLC team who worked with Grade-4 students explored attributes of healthy communities through regular neighborhood walks. Issues such as local food security, ethical consumerism, and the impact of condo developments were examined in an age-appropriate context by co-exploring with students such questions as: what does community mean to you?; what do you know about your community?; what do you like and value about your community?; and, what do you want for your community long-term? The lead classroom teacher contributed and modeled 20 years of "best practice" strategies in facilitating inquiry and place-based learning experiences for primary students, as well as incorporating and modeling the value and process of developing strong relationships with local community businesses, organizations and members to enhance learning outcomes. At the same time, teacher candidates and researchers brought forth insights gleaned from evidence-based research and emerging theory on community social action project learning, environmental education and citizenship. Furthermore, members of the PLC teams, exchanged collective knowledge on entry points and/or identified gaps for curriculum and policy implementation that were pertinent to this particular project.

When considered through our model of relational KMb, this process involved highly complex interactions within and between *people & practices*, *places & procedures*, and *policies & publications*. For instance, a specific mobilization of knowledge can be traced from Ontario's environmental education document (a policy) through the school board (a place) into specific teachers' classrooms (practices). Teacher candidates were key agents of KMb in our network, carrying knowledge back and forth between different places and their situated procedures (schools and the faculty of education). In our model the different categories often operate as closed loops that need to be disrupted (e.g. teachers and teacher candidates sharing knowledge back and forth without it affecting the procedures of either the school or the faculty). Therefore, we worked to iteratively, recursively, and relationally mobilize knowledge through all parts of our network, in order to sustain meaningful change across our various individual practices and organizational procedures. In the next section, we discuss some of our specific successes and challenges in this regard.

Recursively Reflecting on Successes and Challenges: Brokering a Secondary KMb Network

> To evaluate implementation within this framework is to examine the quality of the activity of discovering underlying assumptions, interests, values, motives,

> perspectives, root metaphors, and implications for action to improve the human condition. (Aoki, 1983/2005, p. 119)

In order to evaluate the impacts of our KMb network, we used different quantitative and qualitative methods and tools to gather our data. We invited members of the PLCs (teacher candidates, teachers and administrators) to complete two surveys (one in the fall and one in the spring). This data was supplemented qualitatively by one-on-one interviews with some of the participating school administrators and classroom teachers. In the spring of 2012, a final meeting was held between all participants, at which the PLC team members answered questions about successes and challenges through a placemat activity. This involved writing their individual and collective responses to three given questions on flipchart paper. These responses were then inputted into Wordle—an online program that creates a word cloud where the word size visually increases based on frequency of repetition. This enabled us to represent a visually rich qualitative overview of the recurring concepts put forth in our colleagues' responses (see below for the resultant Wordles). Finally, each PLC produced a two-page report on their project (see www.dgpe.ca for some examples).

During the second year, data collection was more focused on the teacher candidates, who completed three surveys throughout the year, supplemented by individual interviews with classroom teachers. Two focus groups were also conducted including both teachers and teacher candidates. Again, all PLCs submitted a two-page report at the end of the year. This section takes up some of the successes and challenges we experienced during the project. In particular, we present the three Wordles and the survey responses from the end of the first year, along with some representative quotations from individual interviews and focus groups.

The survey responses from the end of our first year give a general overview of the impact our network had on the participants (n=43):

- 97% found the opportunity to work with teacher candidates/teachers collaboratively useful/very useful;
- 87% found that collaborating in PLCs added value to their current classroom practice;
- 90% feel confident/very confident in their ability to integrate global issues into their teaching; and
- 100% identified themselves as open to fostering collaboration with colleagues with a focus on environmental or global education.

Of note here is that these responses indicate participants' motivation and capacity to continue sustaining the network's policy implementation initiatives within their own professional practice. The positive aspects of participants' experiences can be seen qualitatively in Figure 2. Represented in this Wordle are the participants' responses to the following question: "What aspects of this project did you find most exciting, engaging, innovative, creative and/or transformative?" Their responses indicate that our network had effects beyond the specific government curriculum policies we were working to develop and implement in the classroom. While words related to global and environmental education and collaborative inquiry can be discerned, many of the most prominent themes indicate a much broader effect in terms of fostering KMb throughout our network. These include *cross-curricular*, *engaging*, *learning*, *community*, *partnership*, and *connection*.

Figure 2: What participants found the most exciting, engaging, innovative, creative and/or transformative

Our network focused on PLCs developing and implementing curriculum and resources in priority areas that were identified by the Ontario Ministry of Education and the school boards—environmental education and collaborative inquiry. The following quotations from participant teachers indicate our success in generating and mobilizing knowledge in relation to the policy reforms:

> Environmental issues have always been something important for me to teach but it seemed disjointed, it seemed sort of—not one off, but seemed kind of cherry picked in a way. Whereas now, I'm more looking at embedding it into what I do. Into how I'm teaching, . . . that's what I aspire to, as opposed to it being a one-off, I want it to be the vehicle I teach my curriculum through. (Teacher 1)

> Well for me, this collaborative inquiry it's like everything I do now, before kids get started on something, whether it's a piece of writing or whatever it is we're doing, we build the expectations together. I'm not pulling out of my filing cabinet an old rubric and being like "there it is," and I'm just going to throw it at them with a new year on the top. I'm actually building those expectations with them, so that's the collaborative part of it, and it's not easy to do. (Teacher 2)

Teacher candidates stressed the impacts of the PLCs for their professional development:

> Through the project we had the benefit of seeing two forms of collaboration; one being us and the teacher, the other being us and the students so that was really neat

> to see because just being able to work with a teacher in that capacity was really amazing, being able to bounce ideas off of one another, and change back and forth during lessons.

One of the teachers shared the following perspective on teacher candidates as knowledge brokers:

> I'm really a lot more optimistic and hopeful having had this opportunity because I see, pre-service teachers coming in with all these new ideas and they're embedding everything naturally . . . that's really exciting to see because that wasn't my orientation coming into education as a teacher 20 years ago.

In our conversations with the network's participants, they frequently expressed their concerns about the disconnections between Ministry and school board policies and their classroom practice. For instance, while many of the teachers with the public board were working to integrate environmental sustainability into their classrooms, they were unaware of related Ministry initiatives and priorities. Several teachers asked why they had yet to encounter these documents. This gave rise to questions such as how might we ensure that curriculum policy implementation does not become a closed loop or a centralized directive from bureaucrats toward teachers? In response to this pressing question, our findings suggest that policy makers should provide sufficient professional—socially innovative—opportunities for teachers and others (teacher candidates, researchers) to learn, discuss, and debate the why(s) and how(s) for incorporating such policy reforms into their praxis and classroom communities as part of a wider relational KMb network.

Several teachers discussed the impacts of establishing these connections and extending their relationships beyond the classroom in terms of enhancing their opportunities for accessing professional resources and knowledge that exist in other places, procedures, and policies.

> I've always felt kind of alone, I was in this massive building and I felt that I was pushing the rope on my own. Trying to get them just to recycle paper was a nightmare. It's taken a long time to get people to buy in and that sort of thing, and change the culture, but it's been good for me to feel like part of something bigger than myself and to have those connections and be able to say if I want more information on *X* than I'll contact someone at the faculty. I mean I've always been connected with the Faculty of Education but only as an associate teacher… but this goes beyond that. (Teacher 1)

> The KNAER experience has refueled me in addition to renewing my faith in education. The whole project was inspiring frankly. In all my years of teaching I haven't seen such a dynamic… yet necessary… partnership between a faculty of education at a university, public and Catholic school boards, experienced teachers, teacher candidates, professors and grad students all working together… as equals… towards meaningful educational change. (Teacher 2)

> For the first time, I felt like the way I have always taught my students is finally being honored by, the Ontario Ministry of Education, the OCDSB administration, and by the University of Ottawa, Faculty of Education. Personally it is inspiring to be surrounded by like-minded veteran teachers and pre-service teachers sharing

> innovative ideas and also learning from a whole range of students who were allowed to guide and discover issue that they have now become passionate about. (Teacher 3)

Teacher candidates also addressed the impact of establishing new professional relations via the KMb network:

> As a teacher candidate, working with in-service teachers, board representatives as well as members of the uOttawa faculty was a great opportunity. I'm always searching for practical tools for the classroom and this provided me with a number of such tools.

In this sense, our network had a significant local impact for developing relations among educational researchers, school board administrators, principals, teachers, teacher candidates, and students. We were able to foster relations between the different institutional places and people involved in the network.

One of our priorities in building our KMb network was to establish a sense of trust. Schools and school boards often see the Ministry of Education and educational researchers as serving their own (instrumental) interests (Pinto, 2012). Therefore, while we had to work within a certain framework for our KNAER project, we were proactive in inviting participants to collaboratively plan what it would look like to establish and sustain the network through a specific conceptual framework. For example, participants expressed the following:

> I am sharing elements of this program with my staff at our staff meetings, through electronic communications and directly with teachers I work with. More of this will have to happen to ensure other teachers and administrators can recognize and encourage this kind of inquiry-based environmental education. (Principal)

> We intend to make the Social Justice initiative an annual endeavor. It has had a great impact/echo in our community (at school, at home and at Church). We will continue with some of the aspects and we will add new elements/activities. The student involvement was extraordinarily high. (Teacher)

While we no longer had KNAER funding in the second year of our project, the established relationships enabled the relational dimensions of the network to continue.

Subsequently, many of the organizational structures and procedures that were established to set up our network are ongoing, particularly in the public school board. The in-service teachers that were PLC participants have carried on as a PLC network internally, formally emerging into two very active cohorts in 2013: 1) an "elementary teachers environmental education cohort" comprised of 40 Primary/Junior teachers who meet annually for four professional learning days; and 2) an innovative "environmental education inquiry network" comprised of approximately 20 secondary teachers (see www.dgpe.ca). Furthermore, these teachers have become, in many cases, the associate teachers for our teacher candidates, and continue to show keen interest in pursuing an environmental-education-oriented, inquiry-based practicum experience for our teacher candidates during this past 2014–2015 academic year.

This relationship continues to support and extend the multidirectional KMb for our larger Developing a Global Perspective for Educators (DGPE) program and its Global Education Research Network (GERN). In addition, a member of our team has since been contracted by the

board to continue to support these two emergent networks and to support, inform and co-write the environmental education procedure for the district. In many ways, therefore, our process for setting up relational KMb was successful, both in mobilizing knowledge fluidly throughout our network and in terms of establishing and sustaining new practices and organizational procedures for both developing and implementing curriculum policy reforms.

Despite such successes, we also encountered several challenges. The first of these has to do with limited time and resources. This can be seen in the Wordle in Figure 3, which represents responses to the following question: "What aspects of the project did you find challenging, frustrating, limiting and/or problematic?" Some of the most prominent responses illustrated in this second Wordle indicate participants' frustration with the limited scope of our one-year KNAER grant—*time*, *scheduling*, and *timing*. We suggest that many of the other most prominent responses—e.g. *communication*, *expectations*, *aligning-visions*, and *integration*—can also be understood as a result of the limited timeframe to set up and develop the KMb network. This follows Louis' (2010) argument that "sustained interactivity" over the long term is necessary in order to sustain knowledge mobilization among diverse people and places in a way that actually has a lasting impact on practices and procedures.

Figure 3. What participants found challenging, frustrating, limiting and/or problematic

Because our KNAER grant and respective funding was planned for one year, in the second year our network had to continue on a much smaller scale. We invited people who wanted to participate again in the second year to do so, but a lot of the activities had to be undertaken on their own time. Figure 4 represents participants' feelings about the future of the network at the end of the first year, in response to these questions: "Where do you see the project going from here? How can this project continue with/without funding support? How would you like to see it evolve?" Many of their responses indicate their continued optimism for certain aspects of the network. In order to sustain their interactivity, they called for *more release-time* and to *start* knowledge mobilization activities *earlier*. Unfortunately, due to our lack of external funding, in our second year we had less time and resources to support the necessary release-time to support such sustained interactivity. In fact, the majority of our funding went toward teacher release-time so that they could attend the different

professional learning workshops and research presentations, and/or meet with their PLC teams to develop curriculum that responded to the policy reforms.

Figure 4. Participants' hopes for the network after the first year

The second obstacle we encountered was trying to mobilize knowledge (educational research) while also addressing curriculum policy reforms. This can be seen through two different examples. The first is the top-down implementation of Ontario's environmental education policy. Our relational KMb network incorporated multiple places, including the faculty of education, school boards, and schools, and much of the knowledge generation and mobilization happened in dynamic, interactional, and relational ways. Knowledge moved both in "vertical" and "horizontal" ways, including mobilizing what we have learned from participants in our network into our praxis for producing, mobilizing, and sharing future research. While we were quite successful in mobilizing the Ontario Ministry of Education policy reforms, this aspect of the mobilization happened in a more linear and unidirectional manner. As stated earlier, there is a place for such linear knowledge mobilization. However, such mobilization could be more multidirectional if there were a way to mobilize teachers' practical knowledge to inform both our educational research and the government's curriculum implementation policies. Such multidirectional movements of knowledge were not initially part of our strategies for building and extending our KMb partnerships with the school but evolved through the collaborative work of the PLCs.

The second example has to do with issues we encountered around ethics approval. We initially had to apply for ethics twice—once through our university and then through an overarching body for the public and Catholic school boards. However, two weeks before starting the project, one of the board research officers told us we would need to apply for ethics approval again to be able to work with both school boards. This lack of alignment between policies and procedures at the university and school board levels acts as institutional barriers that sometimes threatened to stymie KMb within our relational model. In these different places, policies and procedures often operate as bureaucratic closed loops within the larger educational system. Therefore, memoranda of understanding need to be established through a broader mobilization of knowledge throughout the network or a more fluid movement among the different places.

We would like to see more relational collaboration between the university and school boards in terms of aligning their policies and procedures around ethics approval. This would not entail giving researchers a blank slate to perform research without oversight, but would simply enable the exchange of knowledge within the KMb, and the research done within it, to happen with more agility. Having said this, the project has enabled us to develop ongoing relations that have since mitigated bureaucratic challenges that have slowed down past research proposals. In many ways, now that our team has a better understanding of the school boards priority initiatives, we are able to assess whether or not our research programs and expertise align with their priority areas, along with those of the Ontario Ministry of Education. In turn, the KMb network has enabled us to more fully understand how we can draw upon such policy alignments, and upon our partnerships, to apply together for different research funding opportunities that address each of our individual, collective, and organizational needs.

In terms of implementing curriculum policy reforms within such organizational closed loops, there is a need for sustained interactivity over a longer term than our one-year grant enabled. This indicates that some places and procedures (like the schools we worked with) operate in a more fluid way, and can adapt to the needs of a relational KMb network quite quickly, while other places and procedures (as at the school boards) are more reified, and require more time to become open to the multidirectional mobilization of knowledge. In retrospect, many of the challenges we encountered were exacerbated by our own limited knowledge and training on KMb as we began the process. Consequently, we learned many of our lessons through trial and error.

While KNAER held an initial information session for project leads, we feel it was too limited in its scope and impact. Along with more clear direction on "best practices," we would have appreciated more opportunities to collaborate with other funding recipients, in order to co-create critical feedback on our KNAER initiatives—from vision to implementation to outcomes to next steps. Considering the overall experience within our relational KMb model, we suggest that even the organizational procedures of RBOs like KNAER can sometimes operate as a closed loop as they build their network's capacity, and may not always be able to mobilize necessary knowledge into the practices and procedures of their funding recipients. As a new organization, they too are learning through trial and error. In the next section we discuss what we have learned through this process, including how this project in part has enabled the Faculty of Education to rethink its policies, structures, and programming as part of its reforms for the new two-year Teacher Education program.

Responding to Knowledge Mobilization Trends Within Teacher Education

> Contemporary education reforms are an evolution of education systems over time. (Pinto, 2012, p. 48)

In the preceding sections we use findings from our work with teacher candidates, teachers, principals and school board personnel to demonstrate the efficacy of a relational KMb network that expands Honig's (2006) model and involves highly complex interactions within and among *people and practices*, *places and procedures*, and *policies and publications*. We propose that Faculties of Education are well positioned to act as KMb brokers through developing sustained purposeful collaborations with teachers that support knowledge creation and mobilization by researchers, school administrators, and teachers. What follows is both reflective and forward looking as we consider how our work as recipients of the KNAER funding has led to substantive changes in teacher education practice evident in the design of the new two-year teacher education program scheduled to commence in

September 2015. We frame this discussion under the three elements of our proposed relational KMb model: *People & Practices; Places & Procedures; and, Policies & Publications*. Indeed, the design of our new two-year teacher education program has purposefully sought to embed opportunities for teacher candidates and teachers to engage in such knowledge generation and mobilization within and across such clusters.

People & Practices

The KNAER project enabled us to establish sustainable relationships with schools and teachers that have led directly to changes in practice through multi-directional KMb. Building on the success of our KNAER work we are in the process of establishing further face-to-face interactive partnerships with schools for specific teacher education cohorts of students. Piloted this year and planned for the new teacher education program in 2015–2017, teacher candidates are organized into cohorts (e.g. Comprehensive School Health; Developing a Global Perspective for Educators; French as a Second Language; Imagination, Creativity, and Innovation; as well as an Urban Education Cohort) in which lead teachers within the schools work closely with a dedicated teacher education professor in the recruitment of teams of associate teachers to work with teacher candidates in school-based PLCs. With the assumption that knowledge is created and potentially mobilized from both school practice and teacher education research, we created opportunities for researchers, teachers and teacher candidates to use their professional practice as sites of inquiry that may then lead to innovations in curriculum implementation. Such opportunities have been embedded within our new teacher education program.

All teacher candidates within the program will now, in discussion with the lead teacher and associate teachers within their partnership school, propose a community service learning (CSL) project that would be situated within the school community and serve to address an identified educational, social or community need. Teacher candidates are required to complete one day of CSL each week in their partnership school in addition to their extended school-based practicum. Within each partner school the PLCs comprising teachers and teacher candidates reflect the research-based practitioner model (Nutley et al., 2008) where knowledge is generated through sustained inquiry on practice with the goal of impacting pedagogy and practice of the participants. The PLCs will be school-based and thus impact, we hope, the praxis of associate teachers and teacher candidates. Moreover, iterative and recursive opportunities for KMb are embedded within the teacher education courses. Teacher candidates then have several curricular and pedagogical occasions to share their research with colleagues both in the program as well as with their PLCs. In addition, we have established a series of school-based professional learning sessions that involve the cohort programs and their respective PLCs that are now situated across a cluster of schools located within the two different school boards.

In line with our experience during the KNAER project, the focus of school-based PLCs in the new teacher education program will be placed on 'process' over 'product.' Understanding associate teachers' and teacher candidates' lived experiences with curriculum policy implementation remains one of our KMb network's priorities. We anticipate that for some researchers, administrators and teachers who are accustomed to a product-oriented, or 'end-goal' approach to teaching and/or learning, the fluidity of possibilities within such conceptual parameters will be a challenge. The cohort approach to teacher education where a small team of professors and school-based lead teachers will move fluidly between faculty and cohort partnership schools participating in both university-based and school-based activities is designed to create and sustain the multidirectional fluidity of a relational KMb model embedded within and across different places.

Places & Procedures

Through the KNAER project we transformed a one-year funded project into a socially innovative and sustainable approach for reconceptualising our teacher education programming. This initiated re-visioning and restructuring our existing programs and procedures in line with school board, faculty and ministry priorities as we developed the new two-year teacher education program. The cohort structure with identified partnerships schools, the CSL projects with a focus on sustained collaborative inquiry, and the lead school-based associate teachers who work closely with faculty across university and school contexts have become embedded in our new teacher education program as a consequence of our KNAER experience. These structures, processes and cultures within the new program will support (we hope) the work of teacher candidates, associate teachers and professors in situated inquiry informing pedagogical development and curriculum implementation. Sustained partnerships among faculty, lead teachers and associate teachers can then enable enhanced opportunities to develop school-based professional development that is informed by the work of the PLCs in addition to other educational research.

One of the challenges in teacher education that seeks to actively involve multiple stakeholders continues to be aligning the many different participants' and different institutions' priorities and schedules (teachers, schools, board offices, teacher candidates, professors, etc.). Therefore, establishing structures and expectations that are explicitly linked to faculty, school, and ministry priorities can assist in creating a culture within the program that promotes the collaboration and enhanced engagement of teacher candidates and teachers. In the new teacher education program we have sought to remove barriers to participation through careful scheduling of teacher candidate campus classes to allow, for example, a day dedicated to school-based CSL and extended block practicum allowing for sustained action research projects.

The new teacher education program is, as all programs dedicated to responding to emerging educational priorities, an ongoing work in progress. Even so, the lessons learned through the KNAER project have enabled us to make some substantive changes to structures and procedures, which will facilitate enhanced movement of people and ideas across faculty, school and school board contexts.

Policies & Publications

The Ontario Ministry of Education has been active in developing policy and publishing curriculum reforms and policy frameworks that respond to 21st century learning priorities through publications such as *Character Development Initiative*, *School Effectiveness Framework*, *Equity & Inclusive Education Strategy*, and the *Social Studies Curriculum*. The Ministry is often excellent at creating critical policy and KMb products. However, where the Ministry often falls short, from our perspective, is in the curricular and pedagogical translations of these KMb products for teachers and students in the classroom.

This KMb gap was evident at the first professional learning day of the KNAER project where we welcomed forty self-selected teachers with a passion for environmental education. Of these teachers, only two were familiar with the 2007 *Shaping our Schools, Shaping our Future* environmental education policy framework. Only half of these teachers, all of whom perceive themselves as environmental education champions in their respective schools, were aware of the Ministry of Education's policy framework on environmental education, *Acting Today, Shaping Tomorrow* (2009), and of those 20 teachers who were aware of the policy framework only one teacher had actually read it. The "white spaces" (Cooper, 2013) between the development of policy and products and their uptake by practitioners need to be bridged to afford real changes in practice. Purposeful relationships and engagement is needed at all levels (teacher education, classroom

teachers, and administrators) with respect to the pedagogical translation of the above policy frameworks so they can be enacted through pedagogy and practice in schools.

In contrast to the aforementioned lack of awareness of policy documents, and as a direct result of the collaborations established through the KNAER project, the OCDSB has two internal environmental education inquiry networks that we work with on a monthly basis. This is an example of multidirectional KMb that involves senior school board personnel, teachers and the faculty KNAER coordinator in the collaborative development of district school board environmental education procedures. Such a partnership serves as but one example of how the school board has responded, at a systems level, to the findings of collaborative inquiry conducted by teachers and teacher candidates. Having teachers, senior leadership and faculty involved in the mobilization of school board procedures and practices represents the embedded practice model (Nutley et al., 2008).

In the new teacher education program we also envisage the enhanced development of a 'digital footprint' of the work of teacher candidates and teaches within the PLCs. We have therefore built into the teacher education program opportunities and support for teacher candidates to create and to share digital stories and snapshots of both the 'process' as well as the 'products' that emerged from their PLC inquiries. Establishing and sustaining a digital network, in which all teachers could receive updates on various innovative research projects, will have the potential to be part of each school board's e-mail network system, thereby facilitating the mobilization of knowledge generated through school-based inquiries.

Faculties of Education are well placed to take on the role of knowledge brokers and to foster "linkages and connections *between* and *within* diverse organizations" (Cooper, 2013, p. 191) including advocating beyond the reach of Ministry and District School Board partners at local and provincial levels. Faculties can also mobilize knowledge through their traditional networks of dissemination such as but not limited to professional associations like the Canadian Society for the Study of Education (CSSE), who are now creating innovative KMb spotlight sessions at their annual conference.

Conclusion

In conclusion, we propose that our work in the KNAER project has given rise to two key developments related to establishing KMb networks, implementing policy reforms, and reconceptualizing teacher education. First, we propose that a relational model of knowledge mobilization responds to the particular characteristics and needs for mobilizing educational policy and research. The model affords practitioners and researchers unique multidirectional opportunities to mobilize knowledge within the PLC clusters embedded across the different systems and places. Second, during the KNAER project, what we have learned about KMb has enabled us to become more agile in responding to Ministry initiatives and frameworks through building on established partnerships and embedding new structures and procedures within our new two-year teacher education program. Over the coming two years the new teacher education program will serve as an ongoing site of critical inquiry as we examine the ways in which new structures and collaborative approaches to teacher education pedagogy and practice impact the professional learning and practice of teacher candidates and teachers. In addition, we will continue to examine to what degree a relational model of knowledge mobilization is a useful heuristic to explain how the faculty, in partnership with schools, can serve and support each other more effectively as knowledge brokers.

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