# Table of Contents 25(1)

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# Special Issue on Knowledge Mobilization in and for Education Editorial

# Knowledge Mobilization in Canadian Educational Research: Identifying Current Developments and Future Directions

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In an era of evidence-based praxis across disciplines and societies, knowledge mobilization has become a buzzword. This buzzword, however, remains elusive and ambiguous. The term *knowledge mobilization* (KMb) emerged in the late 1990s in the field of education. Since then, scholars have used numerous terms to describe research-to-practice driven activities, including dissemination, knowledge exchange, knowledge transfer, knowledge translation, knowledge utilization, and knowledge mobilization (Skinner, 2007).

In 2006, the Ontario Ministry of Education (OME) has launched the *Ontario Education Research Symposium* (OERS), an annual 3-day event at which "researchers, educators, and policy makers build networks and partnerships, gain insights into existing education research, identify gaps for future research, and share approaches for connecting research to practice" (OME, 2016). Building on the progress of the previous symposia, the 2016 *Networking & Partnerships: The Core of Achieving Excellence in Education* symposium focused on researcher-practitioner collaborations toward an accessible, integrated, and responsive education system.

Since 2006, *Social Sciences and Humanities Research Council of Canada* (SSHRC) has been committed to: (a) mobilizing research knowledge among researchers, and between researchers and practitioners; (b) facilitating the development of partnerships between researchers and practitioners; and (c) assisting researchers and practitioners in developing networks, tools and best practices through KMb (Kishchuk, 2013). As a result, SSHRC launched *Knowledge Synthesis* and *Connection* programs, and participated in the development of a *Tri-Agency Open Access Policy on Publications* to improve access to the results of Agency-funded research. According to SSHRC (2015), KMb is "the reciprocal and complementary flow and uptake of research knowledge between researchers, knowledge brokers and knowledge users—both within and beyond academia" (para. 15).

Research shows that school-university research collaborations play an active role in decreasing the educational theory-to-practice gap (Baumfield & Butterworth, 2007). The School-Board-University Research Exchange (SURE) network—established in 2008 by the *London*

*Region Managing Information for Student Achievement Professional Network Centre* (MISA PNC) and comprised of 16 school boards and five faculties of education—is one of such partnerships committed to fostering school-university relationships and improving classroom practice (Martinovic et al., 2012). Since 2008, SURE has focused on developing and sustaining an active collaborative relationship among universities and school districts in the London Region to inspire a culture of inquiry, advance research skills, and promote knowledge exchange related to education research. The SURE researchers received a *SSHRC Public Outreach Grant: Dissemination* and a *Knowledge Network for Applied Education Research* (KNAER) grant to enhance knowledge mobilization in Ontario.

Building upon the success of Canadian Society for the Study of Education (CSSE) KMb Days at CSSE 2012 (Wilfrid Laurier University and University of Waterloo) and CSSE 2013 (University of Victoria), the SURE collaborated with the CSSE 2014 conference organizing committee to facilitate another engaging KMb Day in May 2014 at Brock University (See https://csse2014kmday.wordpress.com/). The 2014 KMb event was sponsored by the SURE Steering Committee, the MISA PNC for the London Region, the Ontario Association of Deans of Education, and the Faculty of Education, Brock University. This special issue of *Brock Education* is an outcome of this KMb event. Expanding the KMb discourses initiated by OME, SSHRC, KNAER, CSSE, and SURE, we feature five journal articles and a book review addressing the following questions: How to assess KMb efforts across educational systems? To what extent do educators use research to inform their praxis? How to make KMb work?

## Provincial, National, and International KMb Developments

Cooper's article, "A Tool to Assess and Compare Knowledge Mobilization Efforts of Faculties of Education, Research Brokering Organizations, Ministries of Education, and School Districts," discusses the national and international trends that have contributed toward conceptualizing knowledge mobilization as a field of study. Her work answers important questions such as what are the push and pull factors that inform knowledge mobilization research and inquiry. The article is informative because it builds on the work of researchers focused on the study of knowledge mobilization and practical because it provides insight for researchers, networks, and knowledge brokers searching for a measuring tool to assess their knowledge mobilization efforts across organizations. Cooper reports that "The need to develop tools to measure research use as well as KMb efforts and processes is commonly discussed across sectors," and her KMb matrix tool fills this gap in the literature.

In their article, "Finding the Sweet Spot: Network Structures and Processes for Increased Knowledge Mobilization," Briscoe, Pollock, Campbell, and Carr-Harris report on the KMb practices of 44 KNAER-funded projects that have mobilized research-based evidence across Ontario. The authors discuss the role of the network structures, processes, and structure-process alignments in building KMb networks' capacity for increasing research use and improving student learning. The most successful KMb networks in this study were those networks that were able to strategically align their network structures and processes, and find a "sweet spot." The authors offer insights into the complexities of KMb networks' practices and guidelines for developing KMb capacity across provincial, national, and international networks.

Notwithstanding the implementation of various initiatives and strategies by research brokering agents to support the use of research-based evidence by educators, the widespread uptake of research knowledge utilization by educators especially in regard to informing

2

instructional practice has been problematic. The article by Lysenko et al., based on the results stemming from a pan-Canadian on-line survey of educators on their use of research, outlines a number of challenges confronting educators when using research knowledge. The authors advance a number of recommendations for universities, school boards, and knowledge mobilization agents to undertake in order to increase research evidence use by educators. The paper represents an extension of a previous quantitative study (Lysenko et al., 2014), but is enhanced by an analysis of qualitative data provided by teachers, school administrators, and professional staff.

## Why School-University Partnerships Work

The article, "Exploring the Benefits of a Collaborative Inquiry Team in Education (CITE) Initiative to Develop a Research Community and Enhance Student Engagement," scrutinizes a collaborative inquiry process, facilitated by university faculty in an elementary school in Ontario. Cantalini-Williams et al. collected and analyzed self-study data over a 5-month period and found that "the collaborative inquiry process with enablers of time, flexibility, and support from university faculty increased research acumen among the participants and subsequently increased student engagement." The CITE team "named, framed, and proclaimed" applied educational research, utilized and discussed effective KMb strategies, documented enhanced teacher and student engagement and learning, and provided a set of KMb strategies for teachers, school administrators, and university researchers.

McQuirter Scott, Dortmans, Rath, Meeussen, and Boin reported on a case study based on a long-term school-university partnership exploring iPad use in Grade 3 classrooms. This partnership resulted in an exchange of iPad implementation strategies among participants. Moreover, teachers enhanced their leadership skills while university researchers experienced a high degree of learning about digital pedagogy, and shared the lessons learned with their Pre-service Education classes. The authors argue for flexible, trusting, and long-term school-university partnerships and acknowledge the role of such partnerships in bridging "the current gap between theory and practice in technology-enhanced learning."

## Future Directions

Ghazala Ahmed concludes this special issue on knowledge mobilization in and for education with her review of the Fenwick and Farell's (2012) edited book entitled *Knowledge Mobilization and Educational Research: Politics, Languages, and Responsibilities.* Ahmed describes this book as a critical review of knowledge mobilization and an informative collection of works originating from diverse provincial, national, and international educational contexts. According to Ahmed, the book provides "accounts grounded in empirical studies, real events, and existing organizations," scrutinizes knowledge mobilization activities and outcomes, and urges scholars and educators to further explore the role of KMb in educational research, policy, and practice.

Proud of this special issue and its contribution to the field of KMb in education, we borrow from Dewey' (1929) cautionary advice that research findings cannot "be converted into an immediate rule of educational art" (p. 19). Rather, research questions should be drawn from practice in a continuous manner in order to help teachers improve their teaching methods and competencies. Based on the articles featured in this special issue, we argue that KMb as an established field of inquiry that aims to "address the oft-cited gaps between research, policy and practice" (Cooper, 2012, p. 2) and will continue to shape educational research and praxis.

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# A Tool to Assess and Compare Knowledge Mobilization Efforts of Faculties of Education, Research Brokering Organizations, Ministries of Education, and School Districts

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## Abstract

*There are few tools that exist to measure knowledge mobilization (KMb), the process of connecting research to policy and practice across diverse organizations and sectors. This article reports on a comparison of KMb efforts of 105 educational organizations: faculties of education (N = 21), research brokering organizations (N = 44), school districts (N = 14), and ministries of education (N = 26). This study used a tool that analyzed KMb efforts along two dimensions—research dissemination strategies (e.g., products, events, and networks) and research use indicators (e.g., different types of strategies, ease of use, accessibility, collaboration, and mission)—using data available on organizational websites. Findings show that research brokering organizations and faculties of education are producing stronger knowledge mobilization efforts than school districts and ministries of education; however, even faculties and research brokering organizations often have modest efforts. Most KMb efforts are product based, with network strategies usually being the weakest KMb strategy utilized.*

*Keywords: research use; K-12 education; knowledge mobilization*

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**Context: A Global Call for Evidence-based Policy and Practice**

There is a global call to improve the integration of research evidence in policy and practice in public service sectors (Nutley, Walter, & Davis, 2007), efforts called knowledge mobilization (KMb) in education in Canada. The expectations around the use of research have changed markedly in recent years for all stakeholders. Policymakers in government are being pressured by the public to engage in evidence-based decision making and to be transparent about what sources of evidence inform their decisions (Burns & Schuller, 2007). Researchers are expected to increase the use and impact of their work, and practitioners are under pressure to use research evidence and data to inform their daily professional work. Funders all over the world are also beginning to require researchers to include KMb plans and summarize the potential impact of their work (Tetroe et al., 2008). Practitioners in school districts, including educational leaders and teachers, are also being pressured to increase data use at virtually all levels (Brown, 2015; Finnigan & Daly, 2014).

Research brokering organizations (RBOs) (e.g., intermediary, third party organizations that connect researchers, policymakers, and practitioners) have arisen to help address these gaps between research, policy, practice, and impact (Coburn & Stein, 2010; Cooper, 2014a). I define RBOs in relation to two characteristics: 1) Target audience: RBOs connect research producers *and* research users (hence organizations that connect researchers to researchers only or practitioners to practitioners only are not RBOs by my definition); and 2) Mission statement: RBOs have explicit mission statements and/or mandates in relation to data use, research use and/or knowledge mobilization. While many organizations are involved in research brokering as one part of their organizational activities, RBOs *primary* function is connecting research producers and users in a particular area to increase KMb. My previous work has developed a typology of RBOs that exist across Canada differentiated by funding sources and location in the system (for further description and examples of RBOs, please see Cooper, 2013); major categories of RBOs include governmental RBOs, For-profit RBOs, Not-for profit RBOs, and Membership RBOs (where members of a network actually fund the organization such as teachers' unions). Meyer (2010) describes the role of knowledge or research brokers in relation to building connections between researchers and different potential target audiences:

> Brokering involves a range of different practices: the identification and localization of knowledge, the redistribution and dissemination of knowledge, and the rescaling and transformation of this knowledge. Brokering knowledge thus means far more than simply *moving* knowledge – it also means transforming knowledge…knowledge brokering is likely to look very different in the various brokering spaces…not least because the needs and expectations of the knowledge users might differ substantially. (p. 120)

Despite these new expectations for policymakers, researchers, practitioners, and research brokering organizations, very little is known about the levels of KMb efforts occurring across the education system (e.g., who is engaging in KMb efforts and what kinds of KMb activities are occurring for what audiences). For example:

- The scant literature that does exist indicates low levels of KMb efforts from universities (Sá, Li, & Faubert, 2011; Wilson, Petticrew, Calnan, & Nazareth, 2010);
- The literature indicates low levels of research use in policymaking (Landry, Amara, & Lamary, 2001; Lavis, Lomas, Hamid, & Sewankambo, 2006);

6

- There are low levels of research use and uptake in practice environments (Cooper & Levin, 2013; Cordingley, 2008); and
- There are some empirical studies suggesting that intermediary research brokering agencies can improve and facilitate research use across research, practice, and policy organizations (Coburn & Stein, 2010; Cooper, 2014a).

Given these limitations it is also important to note that, until recently, there was no tool to measure KMb activities across different kinds of organizations and sectors (Qi & Levin, 2013). In this study, I apply the tool created by Qi and Levin (2013) to evaluate KMb efforts of 105 educational organizations in order to answer the following research question: How do the KMb efforts of faculties of education, ministries of education, research brokering organizations, and school districts in Canada compare?

**Conceptualizing KMb From a Whole System Perspective**

This study conceptualizes KMb as systemic efforts to increase research use in policy and practice, and involves many different kinds of organizations involved in the education sector. This whole-system perspective (Figure 1) includes policymaking, research production, research mediation, and research use, all of which are increasingly mediated by websites, online platforms, and social media tools being utilized for innovation and engagement.

## Knowledge Mobilization Occurs Across 4 Domains

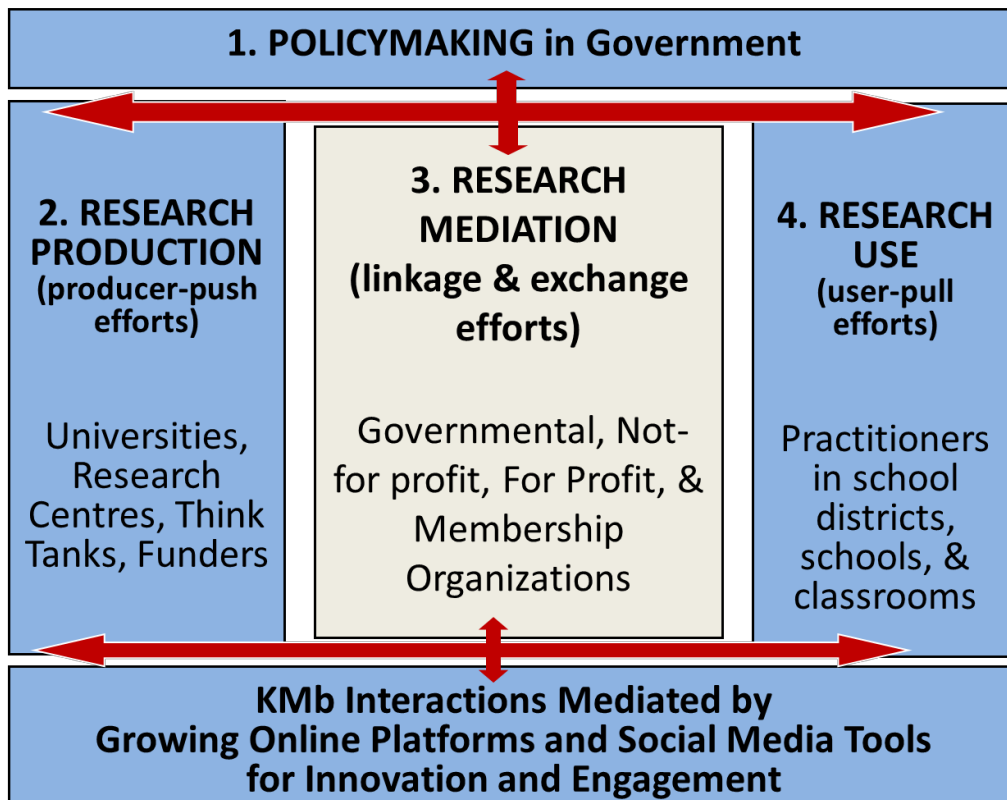| 1. POLICYMAKING in Government | | |
|---|---|---|
| **2. RESEARCH PRODUCTION** (producer-push efforts)<br><br>Universities, Research Centres, Think Tanks, Funders | **3. RESEARCH MEDIATION (linkage & exchange efforts)**<br><br>Governmental, Not-for profit, For Profit, & Membership Organizations | **4. RESEARCH USE** (user-pull efforts)<br><br>Practitioners in school districts, schools, & classrooms |
| **KMb Interactions Mediated by Growing Online Platforms and Social Media Tools for Innovation and Engagement** | | |

*Figure 1.* Knowledge Mobilization from a Whole-System Perspective (KMb/WSP) model.

This model entitled "Knowledge Mobilization from a Whole-System Perspective" (KMb/ WSP) is adapted from Levin (2004); however, it separates the policymaking context from the practitioner context to address the very different purposes, types of work, and time frames for decision making of these two distinct groups, which often require different types of training and information that cater to their specific needs. Additionally, the conceptualization of KMb, which informs this study, acknowledges the changing nature of KMb efforts as they are increasingly mediated through online platforms such as websites and online communities as well as through social media outlets such as Twitter and Facebook (See Cooper 2014b for data on how RBOs are engaging with online dissemination and social media). My conceptualization of KMb in Figure 1 integrates Lavis et al.'s (2006) research utilization models with Levin's (2004) model, articulating the research production domain as "producer-push efforts," the research use domain as "user-pull efforts," and the research mediation domain as "linkage and exchange efforts."

**Justifying the Use of the KMb Matrix Tool**

Before providing an overview of the tool created by Qi and Levin (2013), I would like to present my justification for selecting this tool. I think the major potential critique of this study might be problematizing the use of website data to assess KMb efforts rather than a different methodology (e.g., in-depth case studies of educational organizations). First, I was interested in assessing the KMb efforts of a hundred organizations and case study work was not a feasible methodology due to the size of the sample. Similarly, one of the strengths of this tool is that it can be used to compare a wide range of diverse organizations across sectors, countries, and types of organizations. Scores arising from this tool have since been used to sample top performing organizations in relation to KMb for in-depth case studies, another use for the tool. To use this tool on a smaller subset of organizations, I argue that this tool should be utilized in conjunction with deeper qualitative methodology (such as case studies) in order to provide a comprehensive view of organizational KMb efforts. These choices, of course, depend on the goals of the research—and the goal of this study was to provide a broad overview of how a large number of organizations in the education sector compare in relation to KMb efforts, rather than provide a more thorough exploration of a few organizations. Second, in the current societal context websites are often a primary vehicle to promote organizational activities. Duffy (2000) notes: "the advantages of the medium over traditional communication formats in terms of flexibility, speed and reach make it an obvious route for research dissemination" (p.349). The recent demand to improve knowledge mobilization across public service sectors has been accompanied by an increased use of websites and various other technologies to facilitate dissemination efforts (Chavkin & Chavkin, 2008). As a result, organizational websites have the potential to provide important insights in knowledge mobilization processes occurring across sectors. In addition to this fact, organizational websites often contain information that approximates face-to-face interactions. For instance, events listed on websites often have information about the types of stakeholders attending the event and the content of the event among other details. Similarly, websites often include information about networks of people working together on various projects or initiatives.

While recognizing and acknowledging the limitations of the tool I have chosen to use, I argue that virtually no tools exist to measure KMb efforts across organizations and using the baseline data from this tool is important first step in identifying which organizations should be considered for more in-depth analysis. The Social Sciences and Humanities Research Council (SSHRC) of Canada defines a research tool as:

SSHRC defines research and related tools as vehicles that broadly facilitate research and related activities. Social science and humanities tools enable researchers to collect, organize, analyze, visualize, mobilize and store quantitative and qualitative data and creative outputs. Tools can be created as part of a research or related undertaking, or purchased off the shelf. (SSHRC, 2014)

This tool was created empirically from the evaluation of hundreds of different websites, prior to its application to the 105 I used in this study (for an overview of the first phase of the tool's development, please see Sá, Faubert, Edelstein, & Qi, 2012). The other strength of the tool is that it provides a systematic approach—strategy by strategy and element by element—to look at diverse organizations in a uniform way. While many organizations might be engaged in activities not posted on their websites or have activities on their websites that they no longer engage in, I still argue that when attempting to assess a hundred diverse organizations in the area of KMb where little is known, this study and the use of this tool (while imperfect) still make an important contribution to understanding the relative efforts occurring across the system by universities, ministries, RBOs, and school districts. In summary, I believe the benefits of the tool outweigh the potential limitations of its use. Potential uses for the tool include the following:

- Specific organizations can use the tool to assess their KMb efforts in a systematic way across categories that the literature suggests increase research use and impact.
- Diverse organizations across a sector or between sectors can use the tool to draw comparisons between KMb efforts. This is important because we currently do not know what levels of KMb are occurring across the system (e.g., in universities, in ministries, by RBOs, or in school districts), and identifying the relative intensity of these efforts at different parts of the system can inform system-wide improvement initiatives (e.g., low levels of KMb in particular areas represent opportunities to ramp up efforts in a particular area).
- This tool provides baseline data on the types of KMb efforts led by different types of organizations; hence, organizations can use this data to benchmark their efforts.
- High scores in particular areas of the tool provide exemplary examples and a systematic way to choose cases for further research. For instance, organizations with high network ratings could provide case studies of exemplary practices that others could try to increase their impact in this area.

### An Overview of Qi and Levin's KMb Matrix Tool

The KMb matrix tool (Figure 2) is a matrix that measures organizational research-dissemination strategies (e.g., research-based products, events, and networks) and research-use indicators as they relate to strategies (e.g., different types of strategies, ease of use, accessibility, and audience). The tool was informed by the literature and tested over a two-year period among the Research Supporting Practice in Education (RSPE) team at the University of Toronto (a team of researchers and graduate students) to decide on the various categories and point allotments. See Qi and Levin (2013) for more information on the tool development and Appendix A for details on the breakdown of each cell of the matrix.

9

| Research Dissemination Strategies | | | | | |
|---|---|---|---|---|---|
| | | **Products** | **Events** | **Networks** | **Balance, Accessibility** | **TOTAL POINTS** |
| **Research Use Indicators** | **Different Types** | 3 points | 6 points | 6 points | 5 points | **/20 points** |
| | **Ease of Use** | 2 points | 6 points | 2 points | 4 points | **/14 points** |
| | **Accessibility** | 3 points | 6 points | 4 points | 3 points | **/16 points** |
| | **Audience Focus** | 4 points | 2 points | 4 points | N/A | **/10 points** |
| | **Collaborative, Mission** | N/A | N/A | 4 points | 8 points | **/12 points** |
| | **TOTAL POINTS** | **/12** | **/20** | **/20** | **/20** | **/72** **/72** |

*Figure 2.* KMb matrix tool to evaluate KMb efforts using data from organizational
websites (Adapted from Qi & Levin, 2013).

**Method**

This study compares the KMb efforts of four types of organizations involved in the public education system: faculties of education ($N = 21$) where research is produced, ministries of education ($N = 26$) where decisions about K-12 education are made, school districts ($N = 14$) where educational research is applied, and RBOs ($N = 44$) where the adaptation and translation of academic research for practical use are facilitated. Data was collected using the KMb tool from each organizational website. Data Analysis included descriptive statistics (e.g., frequencies, percent scores, means, and standard deviation), Cronbach's α, and independent-samples Kruskal-Wallis tests (pairwise comparisons were conducted where results were significant), using SPSS.

Reliability testing was conducted using Cronbach's α to determine whether each of the KMb indicator totals (e.g., types of strategies, ease of use, accessibility, audience focus, and other extra indicators) could be reliably aggregated as an overall indicator of KMb efforts. Cronbach's α results range from 0 (*no reliability*) to 1 (*high reliability*). The statistical literature indicates that a value of 0.7–0.8 is an acceptable value for Chronbach's α (Field, 2005). Cronbach's α was calculated for the KMb indicators at .862; therefore, the five variable totals can be reliably combined into a KMb indicator total. The same reliability testing was conducted for KMb strategies (e.g., products, events, networks, and other strategies). Cronbach's α for KMb strategies was calculated at .828; therefore, the four strategy variable totals can be reliably combined into a KMb strategy total.

10

**Findings: Comparing KMb Efforts Across the System**

This section reports on a comparison of KMb efforts of 105 educational organizations: faculties of education ($N = 21$), research brokering organizations ($N = 44$), school districts ($N = 14$), and ministries of education ($N = 26$). Across all organizations, the average score on the KMb matrix was 42%. Disaggregated by type of organization, research brokering organizations had the highest average score ($M = 56.0\%$), followed by faculties of education ($M = 54.3\%$), school districts ($M = 30.4\%$), and ministries ($M = 27.8\%$). Ministries are the most variable ($SD = 13.2$), followed by RBOs ($SD = 12.3$) and school districts ($SD = 10.1$), with universities having the lowest variability ($SD = 6.6$). An independent-samples Kruskal-Wallis test was conducted to evaluate differences among the four types of organizations—RBOs, faculties of education, school districts, and ministries—on KMb efforts. Non-parametric statistical tests were conducted because the data from the website tool are ordinal and not normally distributed. The test, which corrected for tied ranks, was significant, $\chi^2 (3, N = 105) = 42.31$, ($p < .001$); therefore, there are significant differences in KMb efforts among diverse kinds of organizations. Kruskal-Wallis tests do not analyze which groups are different, but only that differences exist; therefore, follow-up tests were conducted to evaluate pairwise differences among the four types of organizations. RBOs and faculties of education perform similarly; school districts and ministries perform similarly; and there are significant differences between these two groups, with RBOs and faculties of education having stronger KMb efforts. Although they provide information about significance, these tests do not calculate effect size. As a result, descriptive statistics and raw scores were used in Figure 3 to show the magnitude of the differences.
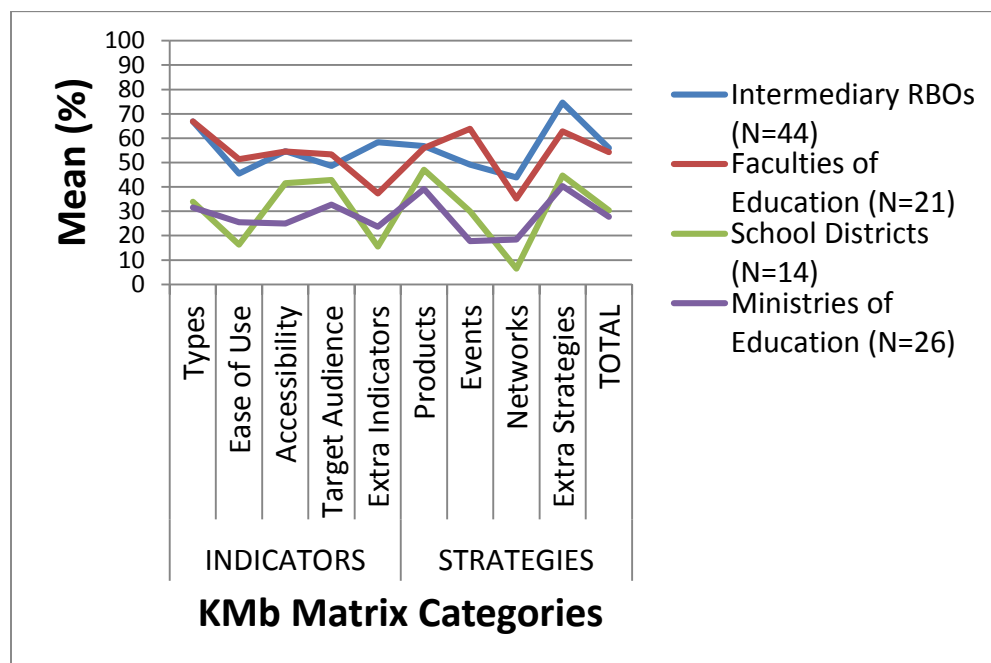


*Figure 3.* Comparison of KMb efforts of RBOs, faculties of education, school districts, and ministries of education.

RBOs and faculties of education perform similarly and score highest on KMb efforts while school districts and ministries perform similarly, scoring lower on KMb efforts; however, there are modest levels of KMb across organizations. With the exception of faculties of education, which scored best on the KMb events strategy, all of the organizations fared best at products followed by events; networks being the weakest of the KMb efforts. Scores on products and events were often much higher than scores on networks (twice as high in ministries of education, seven times higher in school districts, and one-and-a-half times higher in faculties of education). Faculties of education had the highest score on KMb events, with many research events, talks, and lectures listed on their websites. It is a common misconception that academic events, which allow researchers to push out their work by simply telling people about their research, will increase research use. The literature, however, suggests that much more active and interactive forms of research exchange are necessary if research is to be incorporated into daily practice by teachers and policymakers in a meaningful way (Nutley et al., 2007).

All four kinds of organizations scored the lowest on utilizing networks as a KMb strategy (although faculties and RBOs did better than school districts and ministries). Network strategies were assessed in relation to the diversity of existing network types and the frequency of activity and interaction within each network were assessed. Organizations that had a high score in this category circulated research-related e-bulletins to their networks, an example of a "producer push" strategy. RBOs score highest on network activities and interactions, with scores on average almost 10% higher than faculties of education. RBOs often had diverse membership composition and range of various stakeholders. In most cases, the primary role of RBOs was networking among diverse organizations and groups. Very few organizations, including RBOs, had features on their websites that would allow two-way communication (exceptions to this are found in some RBOs: *Canada Education Association*, *Research Impact from York University*, *People for Education*, and *The Learning Partnership*). Even where interactive features were available on websites, there were usually low levels of actual activity (the only exception to this was *People for Education*, which included an active online forum and network of parents across the province).

Another area where faculties of education, school districts, and ministries fared poorly was in the collaborative category, which contained ratings for the collaborative nature of the network and also evaluated the mission statement of these organizations in relation to KMb. One area where school districts scored more closely to faculties of education and RBOs—and better than ministries—was audience focus for their KMb products, events, and networks. School districts often had resources tailored for teachers, students, and parents. This may be due to the increased emphasis on differentiated instruction and meeting the needs of diverse populations in education, which may have contributed to targeting their KMb efforts to the specific needs of different stakeholder groups.

Most organizations had fairly low scores on KMb efforts. Figure 4 shows a histogram of total scores by type of organization.
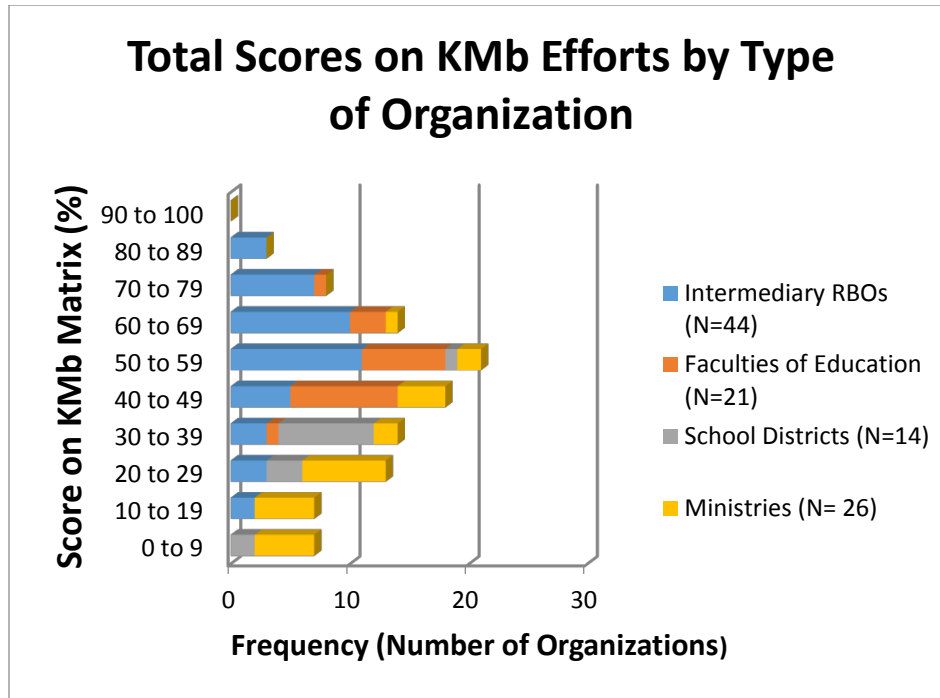
*Figure 4.* Histogram of total scores on KMb efforts by organizational type.

Seventy-six percent of the organizations (80/105) scored less than 60% on the evaluative matrix. RBOs tended to score highest on the matrix, with 20 out of the 25 top organizations being RBOs.

### Discussion and Implications

Research producers (faculties of education) and RBOs tend to be more engaged in KMb efforts than research users (ministries and school districts). Findings from this study suggest low levels of KMb efforts in school districts and ministries. The efforts of faculties of education and RBOs are moderate, with some organizations being extensively engaged in these efforts. Of the 13 organizations out of 105 that scored between 70% and 90% on their KMb efforts, 12 (92%) were RBOs; so, the top-performing organizations in terms of KMb efforts are RBOs. A potential explanation for this trend has to do with the priorities and focus of the different kinds of organizations. The primary focus of faculties of education is research; as a result, research and its dissemination is an important part of how universities function. Increasing the profile of research in society is important for faculties because it galvanizes the government funding and societal support necessary to keep operating. Given this reality, it is surprising that faculties of education still only score moderately on KMb efforts because research and its importance have perhaps been longer on their radar than on the radars of other kinds of organizations. It is difficult on most university websites even to ascertain what research is being done by whom (Sá et al., 2011), let alone what the implications of that research might be for sector stakeholders that might apply that knowledge.

Organizations such as ministries and school districts have not articulated their research priorities until recently; hence, their low levels of KMb efforts are not surprising and are consistent with the literature (Cooper & Levin, 2010; Nutley et al., 2007). These kinds of would-be user

13

organizations focus on teaching, learning, and student outcomes.  Only in the past few decades has the discussion about how to improve public services begun to revolve around evidence-informed decision making to support policies and practice. Despite the growing awareness of the need for research to better inform service delivery in the health and education sectors, these linkages are still far from explicit. This is true for a multitude of reasons: a lack of understanding of how to build these linkages, a lack of skills and capacity to do KMb work at the practitioner level (although this should not be construed as a lack of competence, intelligence, or willingness to do so on the part of frontline practitioners), and a lack of organizational and system-level processes to facilitate systematic KMb efforts across a large number of organizations and professionals.

RBOs focus explicitly on efforts to connect research to practice, so it is not surprising that the majority of the top-performing organizations in KMb are these organizations that have explicit mandates in relation to connecting research producers to research users. Strategies used by RBOs are not always consistent with the growing evidence on effective KMb strategies; often, passive strategies are being utilized such as creating and posting research summaries online rather than investing in long-term substantive network efforts. Explanations for this might include the cost and resources required to build and sustain networks rather than the one time investment of creating a product or hosting an event. Although there might not be extensive empirical evidence on KMb, what does exist is largely ignored, as shown by the focus on passive strategies such as posting research-based products on websites rather than investing in multi-stakeholder network strategies. Studies have shown fairly clearly since the 1960s that passive strategies are not effective and that when the content is focused and relevant, events and networks are more powerful change mechanisms; however, in the new age of Internet communication, organizations tend to spend most of their time creating research products and posting them online—a passive strategy that is unlikely to increase uptake (for some data on the uptake of online research, please see Edelstein, Shah, & Levin, 2012).

It should also be noted that a potential limitation of this study has to do with assessing and designating KMb efforts as low, moderate, or extensive. This study is the first to analyze baseline data from different organizations in education on their levels of KMb efforts. Only with time and more empirical data, a better understanding of appropriate KMb activity benchmarks for different kinds of producers, users, and RBOs will emerge. The KMb matrix tool provides an approach to measuring and comparing KMb efforts across diverse organizations, addressing the need for tools lamented throughout the literature. Other kinds of ratings are certainly possible. The need to develop tools to measure research use as well as KMb efforts and processes is commonly discussed across sectors (Lavis et al., 2006; Mitton, Adair, McKenzie, Patten, & Perry, 2006; Nutley et al., 2007).  Although this matrix might seem crude, it is still one of the first tools to begin exploring how research dissemination efforts of diverse educational organizations compare. This tool can also be used by organizations to assess and think through their KMb efforts. As stated earlier, online data often mirror interaction occurring face-to-face in the real world; hence, these data can provide an estimate of actual levels of KMb activity. For this study, although not reported in this article, the KMb matrix was adapted to include space for providing written descriptions of each element of the matrix in addition to a point score. The written analysis of each organization contained descriptions of the kinds of resources found on the website, the major themes addressed, and interesting KMb practices and networks.  As a result, this tool is not simply a way to compare organizations quantitatively, but it provides a systematic approach to examine each organization in a consistent way.

The ultimate aim of the tool is to provide data to guide more focused investigations of the various partnerships, events, and products uncovered by the application of the KMb matrix to further investigate how these KMb strategies influence research use in education. The descriptive comments in the matrix, in conjunction with the quantitative assessment, provide organizations with ideas for how they might improve their communication of research using their website. Also, this study yields some examples of organizations doing well in various areas. The tool can be used to learn from organizations that score high in areas—for instance, exploring the organizations that score the best in the networks strategy might yield ideas and resources for other institutions to utilize in their KMb efforts.

This approach, as a way of mapping and comparing activity across a number of organizations, could be a first research phase in a variety of contexts, including schools, districts, ministries, and faculties of education.  Using a website analysis for initial data collection provides the data necessary to construct detailed organizational profiles that can guide the development of more focused survey and interview instruments. This approach also reduced potential response bias; for instance, websites and annual reports provide more reliable data than that collected via self-reporting mechanisms such as asking individuals about the scope, resources, and staffing of their institution.

## Conclusion

The field of KMb in Canadian education, as well as globally, is still in its infancy for the following reasons: (a) the modest levels of KMb efforts occurring across sectors, (b) the obscurity surrounding the various roles that different organizations can or should play, and (c) the lack of empirical work in virtually all areas. This is especially true regarding the lack of methodological approaches and tools to gauge KMb efforts and its impact. To move the field forward, development of methodological tools is necessary—alongside replication studies in which tools that do exist are widely applied and tested—to accumulate reliable bodies of evidence that can inform the field of knowledge mobilization in Canada and internationally.

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### Appendix A: Matrix to Evaluate KMb Practices of Organizations Using Website Analysis

| Strategies & Indicators | Products | Events | | Networks | Balance, Accessibility | Total |
|---|---|---|---|---|---|---|
| **Different types** | 1 point (1-2 types ) <br> 2 points (3-4 types) <br> 3 points (5-6 types) | 2 points (1-2 types) <br> 4 points (3-4 types) <br> 6 points (5-6 types) | | 2 points (1 type ) <br> 4 points (2 types) <br> 6 points (3 types) | 1 point (1 strategy); 2 points (2 strategies); 3 points (2 strategies with a good balance ); 4 points (three strategies); 5 points (three strategies with a good balance) | **/20** |
| **Ease of use** | 1 point (means provided to make comment on the main page) <br> 2 points (means provided to make comments on specific products) | 2 points (occasional follow-ups) <br> 4 points (regular follow-ups) | 2 points (events archived) | 2 points (archived network communication ) | 1 point (1 searching tool) <br> 2 points (2 searching tools) <br> 3 points (3 searching tools) <br> 4 points (4 searching tools) | **/14** |
| **Accessibility** | 1 point (small portion) <br> 2 points (large portion) <br> 3 points (all) | 2 points (conditions attached) <br> 4 points (part of events with conditions attached) <br> 6 points (no conditions attached) | | 2 points (once every 3 months or less) <br> 4 points (more frequently) | 1 point (low readability) <br> 2 points (average readability) <br> 3 points (high readability) | **/16** |
| **Focus of audience** | 1 point (part of products) <br> 2 points (part of products with clear application information) <br> 3 points (all products) <br> 4 points (all products with clear application information) | 2 points (brief introduction) | | 2 points (general introduction about who is involved in the network) <br> 4 points (clear introduction about purpose, who is involved, and the contributions) | | **/10** |
| **Collaborative nature of network; mission statement** | | | | **Collaborative nature of the network** <br> 2 points (some indication) <br> 4 points (strong indication) | **Explicit KMb statement on the site** <br> 2 points (general statement ); <br> 4 points (clear statement without overall plan); <br> 6 points (strong statement loosely connected to org. overall plan); <br> 8 points (strong directly connected to org. plan) | **/12** |
| **Total Points** | **/ 12** | **/20** | | **/20** | **/20** | **/72** |

18

# Finding the Sweet Spot: Network Structures and Processes for Increased Knowledge Mobilization

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## Abstract

*The use of networks in public education is one of many knowledge mobilization (KMb) strategies utilized to promote evidence-based research into practice. However, challenges exist in the ability to mobilize knowledge through networks. The purpose of this paper is to explore how networks work. Data were collected from virtual discussions for an interim report for a province-wide government initiative. A secondary analysis of the data was performed. The findings present network structures and processes that partners were engaged in when building a network within education. The implications of this study show that building a network for successful outcomes is complex and metaphorically similar to finding the "sweet spot." It is challenging, but networks that used strategies to align structures and processes proved to achieve more success in mobilizing research to practice.*

***Keywords:*** *networking, knowledge mobilization (KMb), network structure, network processes, network alignment, education.*

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## Introduction

In the past few decades, discussions about how to improve public services have included attention to evidence-informed decision-making, policies, and practice. Despite growing awareness of the need for research to better inform the education sector, the ways in which academic research impacts education are still far from explicit (Cooper, 2012). Encouragement for stakeholders to generate discussions on strategies for connecting evidence-based research and practice to education is gaining momentum, and therefore, the notion of knowledge mobilization (KMb) is becoming a guiding principle (Bienzle et al., 2007). Although KMb has many interpretations, it can be broadly defined as intentional effort to increase the use of research evidence (data collected through systematic and established formal processes of inquiry from empirical work) in policy and practice in the education sector among and between individual, organizational, and system levels (Nutley, Walter, & Davies, 2007; Qi & Levin, 2011). KMb occurs through intricate social processes involving interaction among groups or contexts to improve the broader education system (Cooper, 2012). This suggests that a powerful avenue to change practice is through networks, as networks have the potential to create ongoing social contact (Gilchrist, 1995, 2000; Watson, Townsley, & Abbott, 2002).

The use of networks in public education is one of many KMb strategies utilized to promote turning evidence-based research into practice. There is ample evidence to suggest that school-to-school networks and partnerships are likely to be powerful ways to increase the means for education improvements (Castells, 2001; Church et al., 2002). School partnerships involving external networks with research-practitioner relationships are increasingly being seen as a means of facilitating KMb for increasing research use in practice (Ainscow, Muiji, & West, 2006; Chapman, 2008; Chapman & Fullan, 2007; Earl & Katz, 2007; Hargreaves, 2003; Organisation for Economic Co-operation and Development [OECD], 2000).

Currently, there is extensive research pointing to the importance of building network connections (Finnigan & Daly, 2014; Nutley et al., 2007). However, the idea of networks and networking can be adopted without an understanding of the complexity and challenges of effective KMb through external partnership networks. Continuously exploring means for increased KMb is a dedicated endeavour for all educational partners (Ontario Education Research Panel, [OERP], 2006). Nevertheless, evidence regarding how networks are established and operate in education systems to increase KMb is sparse (Best & Holmes, 2010; Provan, Fish, & Sydow, 2007). A clearer understanding is needed about what to emphasize in order to foster successful and productive networks in education. The purpose of this paper is to explore how structures and processes of networks are built within education for increased KMb of research-based evidence to practice. The paper presents a secondary analysis of findings from a qualitative study. This article is framed around concepts of network structure and processes with a focus on an alignment of the two. From these findings, leadership teams, researchers, project coordinators, intermediaries, and the like can gain a deeper understanding and know-how to mobilize research knowledge across their networks with the goal of improving education.

## Networks

Networks are complex and contested. For this article, we specifically focus on social networks for the purpose of building partnerships. Although social networks are recognized as a powerful

medium for sharing knowledge and effecting change (Daly, 2010; Degenne & Forsé, 1999; Kilduff &Tsai, 2003), they are also difficult to build and maintain (Gowdy, 2006).

Networks can be formal, informal, or a combination of both (Ávila de Lima, 2010; Bate & Robert, 2002; Brass, Galaskiewicz, Greve, & Tsai, 2004), and they can exist in the private and public sector, industry, government, and not-for-profit organizations. Networks in education are described as "groups or systems of interconnected people and organizations (including schools) whose aims and purposes include the improvement of learning and aspects of well-being known to affect learning" (Hadfield, Jopling, Noden, O'Leary, & Stott, 2006, p. 5). Networks can occur within and across different levels of a sector (Borgatti & Foster, 2003). Involvement in some networks can be time-consuming or with ad hoc groups; others require less involvement. Participation may be face-to-face in real time or virtual by asynchronous or synchronous means.

**Network Purpose**

Network purposes can vary drastically. Many educational networks exist at a macro level where the overall purpose is improving student and school learning or achievement. However, other purposes may require networks at a meso level (e.g., investigating how various norms of workplace behavior vary across professions) or micro level (e.g., an examination of "the self") (Borgatti & Foster, 2003). In this article, we consider a specific kind of network: networks for KMb.

**Education Networks for the Purpose of Knowledge Mobilization**

The networks explored in this article focus on utilizing KMb strategies to connect bodies of evidence-based research to education practice. They are engaged in specific KMb efforts to:

- push and pull knowledge,
- build capacity among professionals,
- create KMb professional development tools based on research-based evidence, and
- act as knowledge brokers.

These networks are complex. We wanted to know how these networks were structured and what network processes were utilized.

## Alignment of Structures and Processes in Networks to Mobilize Evidence-based Education Research

Networks that mobilize evidence-based educational research into practice could be considered learning partnerships. According to Earl and Katz (2005), networks are complex interactions between structures that create and support the network and activities that are carried out. The ways in which the network stakeholders organize and interact are not always predictable or similar. Our conceptual framework consists of three concepts:

- network structures,
- networking processes, and
- alignment.

Specifically, we consider the manner in which network structures and their processes are aligned. Our overarching goal is to use this lens of aligning structures and processes to build or extend KMb networks in order to increase research use in the classroom and improve student learning.

## Structure and Process

Networking draws on a complex mixture of structures and processes to bring people together in partnerships to generate and transfer new or existing knowledge. We frame this paper with the following definitions of network structure, processes, and alignment.

**Network structure.** Network structure is defined as coordination in the organizational design of a network to carry out interactions between partners. An organizational design creates a defined, manageable, and thus predictable flow of inputs and outputs through a network for performing strategies that achieve the desired result (Worren, 2012). Network structures also include supports that allow a network to function in an organized way. Supports can include formal and informal policies and practices such as formalized groups or roles, resources such as hired personnel and funding, or some infrastructure for communication such as a shared web platform.

**Network processes.** Network processes are purposeful and coordinated activities performed vertically and laterally within a network to interact with organizational partners. The intended outcome is to accomplish some goal(s). Typically two-way flow of processes is used in networks to disseminate and receive information. These processes focus on specific aspects for value creation and distribution such as activities for creating new products, providing services, interpreting research/data, and building relationships (Worren, 2012).

**Alignment.** Network structures and the processes they engage in can work independently. However, to achieve end goals, synchronization of both is necessary. This is known as alignment, which stems from the idea to "match," "align," or "fit" resources or common goals to intended outcomes (Andrews, 1971; Chandler, 1962; Venkatraman & Camillus, 1984). Overall, alignment is "the degree to which the needs, demands, goals, objectives, and structure of one partner are consistent with the needs, demands, goals, objectives, and/or structure of other partners" (Nadler & Tushman, 1980, p. 40). For example, networks can engage in a process to co-produce audience-appropriate resources and have appropriate communication structures to disseminate the products.

In the end, it is the ways in which networks align the structures they work within and the processes they enact that will determine their success (Worren, 2012). Gupta, Karimi, and Somers (1997) found that success is heightened when network structures and processes are aligned with focused strategies or goals; this ensures the organizations or partners are well positioned to work together to change practice and produce professional development tools or resources for goal attainment. The more network structures and processes are aligned with network partners, the fewer barriers and challenges are likely to exist. For example, when network partners have completed a needs assessment and established a common goal (or goals), processes of creating and disseminating professional development tools to achieve the goal can be more effective. A challenge in achieving alignment is identifying specific sources of interdependencies and interrelationships in structure and processes to improve alignment. Such identification is complex because of the interacting social nature of processes, which includes key components such as relationships and trust (Siggelkow, 2001). Orchestrating a network that simultaneously addresses

the interdependency and interrelationships of structures and processes for creating synchronicity for effective KMb is a challenging endeavour.

## Methodology

This article is based on a province-wide government initiative. The initiative was a unique, four-year KMb effort called *The Knowledge Network for Applied Education Research* (KNAER). The KNAER was a collaborative partnership between the Ontario Ministry of Education, the University of Toronto, and the University of Western Ontario. The goal was to support evidence-based, research-informed decisions connected to Ontario's provincial education goals. The KNAER funded 44 projects that focused on mobilizing research-based evidence throughout the province. The main findings and analyses presented in this study were generated from data collected for an interim government report investigating how best to support KMb networks within the KNAER projects. For the initial analysis and report writing, each primary investigator of a KNAER project was sent an invitation via email to participate in a virtual discussion about networking. Eight virtual sessions were scheduled within a three-week period. To accommodate as many participants as possible, options for face-to-face interviews, phone interviews, and written submissions were also included. In total, 21 people participated from 19 of the 44 projects, of which five people contributed to more than one session. In the end, the data were collected through eight web conferences using Blackboard interface, one face-to-face interview, one phone interview, and five written submissions. All sessions were recorded and transcribed for analysis. The data were collected between November 9 and December 3, 2012. Before the sessions, participants were provided with three main questions:

1. What networking strategies (e.g., relationship building, dissemination of knowledge products, network creation, and network expansion) are working well within your network?
2. Other than time and funding, what challenges are you experiencing with your networking?
3. How can we make connections to education organizations (e.g., schools, boards, professional associations, universities, and government) to access, share, understand, and use research-based knowledge?

From the initial data analysis of the challenges the participants encountered when supporting KMb networks and the best strategies they employed to overcome some of these challenges, we realized that KMb networks were complex and not only required linear cause and effect solutions, but also an exploration of the network composition. For this reason, the secondary analysis also included a document analysis of KMb plans, interim reports, and final project reports.

### Data Analysis

It became clear during the initial analysis that capturing themes encountered in KMb networking and strategies employed to build networks was helpful, but only in terms of recognizing the challenges and strategies. Upon completion of our final report to the Ontario government, two years later, our continued learning led us to re-consider KMb networks as complex structures (Pollock, Campbell, & Briscoe, 2015). This enabled us to re-conceptualize the data from the interim data collection through notions of network structures, the processes they engaged in, and

the alignment of these structures and processes (Baker & Jones, 2008). The secondary analysis involved re-analyzing the data from the interim report, including the simultaneous re-coding of the raw data and the construction of categories and subcategories connected to network structures, processes, and the alignment of the two. Coding was assigned on two levels: identifying information about the data by designation of key words surrounding network structure or processes, and interpretive constructs related to the analysis (Merriam, 1998). Our findings are presented based on the two areas of our conceptual framework: (a) network structures for success and challenges and (b) processes KMb networks engaged in and challenges.

The document analysis phase included an analysis of the 44 KMb plans submitted at the commencement of the initiative, the 141 interim reports submitted during the initiative, and the 43 final project reports submitted at the end of the KNAER funding. Detailed KMb plans were submitted and provided general information such as:

- an overview of the project,
- budget request,
- project lead,
- partnership information and qualifications, and
- relevant experience and expertise of those involved in the project.

Additionally, the KMb plans outlined a project work plan or action plan, which included a statement of objectives, focus/alignment with Ministry priorities, partnerships, and any connection to previous research.

The interim reports asked project principal investigators to report on the following:

- accomplishments,
- next steps,
- challenges, and
- success stories.

The final reports requested:

- information about projects,
- an outline of the action plan that included activity/output,
- KMb products,
- KMb events,
- KMb networks,
- additional impact measures,
- KMb efforts,
- challenges,
- success stories/accomplishments, and
- recommendations.

## Findings

Several themes emerged about structures and processes for building new networks or expanding existing networks for KMb. In this study, network structures are framed as organizational designs to carry out interactions between partners within networks.

### Network Structures for Success

Our analysis indicated the following components of successful networks:

- similar goals and objectives to current government priorities,
- inclusion of key people and organizations,
- formal roles and responsibilities, and
- organized methods of communication.

**Network goals/objectives similar to current government priorities.** All KNAER projects were required to indicate in their proposal their goal alignment with that of the provincial government. However, aligning goals within a written proposal and then establishing these in practice was not entirely the same. KMb networks that had explicitly similar goals and objectives to the current government priorities had a clear advantage over those networks that had goals that were more generally connected. The goals set by Terry's (pseudonyms are used in this study) network are aligned with one of the four Ministry priority areas. Terry stated: "We have heard loud and clear that our network goals have to align across the different branches: their messaging and their focus." KMb networks that did not clearly articulate to partners that their goals were central to Ministry priorities appeared to encounter more difficulty in carrying their KMb plans to fruition. As indicated by Paula, "some boards have found that it's not a priority or people don't understand what information is being disseminated." Andy reiterates a similar message: "School boards tell me indirectly that's a really good idea but 'we're not going there right now.' The decision makers have decided they're not going to, or they don't want to become involved. It's just not the right time." We know that successful networks are those that have clearly defined goals. However, for some KNAER project networks that had come together around agreed upon goals, this alone was not enough to gain momentum for making a meaningful impact. Participants' feedback demonstrates how, for KMb networks, the goals or objectives had to align with those of government priorities and be clearly communicated to partners. Otherwise, networks found they had limited influence.

**Key people and organizations as members.** KNAER networks were encouraged to create partnerships with different stakeholders. Within KNAER's 44 projects, on average, each project had four partners; in total, there were approximately 150 partners, including 60 partnerships with a community organization, 46 with school boards, 22 with universities, 10 with health organizations, and 8 with colleges. However, it was not necessarily the number or types of existed partnerships that created success, but whether the organizations or individuals chosen as partners possessed access to end users, or participated in top-level decision making at the district or provincial level. All members of the 21 projects represented in this study mentioned involving strategic people and organizations as network members. As Sandra commented: "It's not just about diversity [of people within a network], but a diverse network made up of key strategic people." Kimberley indicates what kind of strategic person she thought would help support her

25

network: "I was looking for people who weren't just involved, but those who are very community oriented and have done a lot of work for the community. It was a selective process…" In addition to including strategic individuals, many KMb networks strategically developed partnerships with key organizations that could support their goals. For example, Robbie explained: "We had the Canadian Mental Health Association, different parents' associations, and the health units….We tried to develop a group of people that are actively passionate about this cause to get involved and then we can disseminate information further." While some KMb networks were creating new working relationships with key organizations, others were relying on nurturing existing relations. Doug commented:

> We established relationships with the teachers' union eight years ago. It was valuable because it gave us direct access to teachers that we couldn't get any other way. We didn't have to go through school boards for access. We went through the teachers' union summer institute list, so we had email and direct access to teachers across the province.

It is clear that multiple partnerships were an asset to successful KMb networks. However, when access to key people was limited, challenges occurred. Haley stated: "There are people who are high up on the school board, and they haven't attended our events, and so a challenge for us is to access these people." Having key organizations and people involved meant that KMb networks had opportunities for increased access to possible end users of any materials created, and increased access to additional communication and advertising outlets, to name but a few advantages.

**Formal roles within networks.** Many projects indicated that formal leadership roles were necessary. Some of these positions were held by individuals while others were a collection of individuals, such as steering committees. Andrea explained that her network had "five coordinators work within each of their three different school board partners." Noah described how his network utilized steering committees:

> Prior to building our network, we formed a steering committee to help decide on goals, communication. We arranged to have meetings with the superintendents to discuss what the projects were about and then discuss setting up steering committees. The committee would be comprised of people that the school board and superintendents thought would be good representatives on behalf of the teachers.

As Noah stated, formal roles within the networks were established to help achieve the goals and objectives. Moreover, because KMb networks were complex with multiple partners, formal roles were assigned or responsibilities designated to established better organization.

**Formal communication structure(s).** Because of the level of complexity, KNAER networks that appeared to have some impact included specific, intentional, and often formalized ways for participants to communicate about network goals, and to disseminate, share, and co-produce knowledge. For example, Terri's network produced a digital professional learning paper that was publicly available to all those involved in the network. The content of the paper included the network goals and suggestions that allowed teachers to see how this might look within their classrooms.

Not all networks had considered how they would communicate their decisions and actions. Challenges occurred when networks and their potential partners did not have clear structures in

place for an easy flow of communication. As Andy commented: "Clear communication structures are crucial because they affect awareness and visibility of your network."

## KMb Network Processes

The participants in this study indicated when network structures were in place, they then began to engage in particular kinds of processes. Network processes are framed as purposefully coordinated activities performed within a network to interact with network partners in order to improve KMb. Our analysis indicated that many participants were describing processes or actions needed for KMb networks to achieve some success. These processes included: creating opportunities to collaborate and co-create KMb products, motivating and incentivizing, and strategic planning. Furthermore, it became evident that the processes described did not work independently of each other, but rather they occurred interdependently.

     **Creating opportunities to collaborate and co-create KMb products**. One of the KNAER's goals was to facilitate the development and dissemination of advanced knowledge through the application of applied education research to influence educational practices. It became clear that the networks that came together and were productive were those that intentionally operationalized their goals. These networks reported moving beyond notions of being a think tank or advisory group and provided opportunities for collaboration and co-creation. Approaches to outreach included different ways of collaborating and co-creating, such as engaging in communities of practice, developing and delivering workshops, and participating in online forums. For example, Sara commented: "We're running an Adobe Connect session after school for teachers to gain access to the knowledge. That way it's things they can take back to their classroom." Andy added: "We conducted six virtual sessions and created products from what other people have suggested." The networks established the mediums of collaboration as a way to share educational research with their partners. However, what was demonstrated by the more successful networks was that collaboration was a way of gaining information from participants to co-create products and generate ideas that were based on their needs rather than on predetermined plans. As Doug reiterated:

> From the start we decided that we wanted to engage in a collaborative process: how can we work together to address both the school board's needs and the way they do things while also addressing the mandate of our grant?

He further explained: "During our two focus groups, we identified main themes that the practitioners wanted to address regarding mental health themes. We pinpointed a product that matched those needs very closely." In this case, there was a concerted effort to meet educators' needs.

     It is important to note, however, that building collaboration is more than listening to practitioners' needs and providing a product; an effort must also be made to provide partners with a sense of ownership and include them in the decision-making process. As Andrea mentioned: "It's when people are actually engaged in the thinking and part of the process that we get something that goes beyond fairly superficial utilization." Network actions that involved collaborating with all partners led to a sense of co-ownership whatever was co-created. Projects that provided opportunities for partners to be engaged in processes saw much more KMb success

within their network. Some networks struggled with creating opportunities for ownership and turned to additional ways to motivate and incentivize participation.

      **Motivating and incentivizing.** To increase participation both within the network and, where appropriate, with end users, participants mentioned methods of motivating and incentivizing. As Sherri stated: "Unless people feel that there's a reason for them to connect with you, they might not do it. Therefore, it's really important to make the case for why it is helpful for them to connect." One way to "make the case" is to provide network partners or end users with KMb products that were written in audience-appropriate language and clearly explain why a product might be useful for them. Fran commented: "With our project, the most difficult part was getting educators to look at research. So we offered the information in a language that was friendly and useable for them." Describing research and findings in a language that appealed to practitioners was challenging for some project leaders who were unfamiliar with writing for a particular audience. Sherri explained that her network created a process for translating academic research into practical language for practitioners as a way to motivate researchers to engage and contribute their research:

> To make it more appealing for researchers to submit their research and participate in our network, we had people write the summary for the researcher because the researcher might not want to spend a lot of time on that. We had a team with the skills necessary to do the work and that made it much easier for the researchers—they were more willing to partner with us.

Creating processes to produce audience-appropriate KMb products was a motivating factor for network partners to become connected to the network initiative of mobilizing research-to-practice knowledge.

      In some cases, researchers were motivated to engage in KNAER projects because they could see how their input and ideas were being applied. For example, Tina commented:

> There was an incredible willingness established when people see the quality of learning from participants and the quality of the records of practice developed through the project. We consistently and sincerely expressed our appreciation to the teachers and the students involved and to highlight their incredible wisdom and learning when sharing the artifacts with others. We honestly feel honoured to work with and learn from them, and I think that continually reiterating this to them and others has contributed to the willingness of others to engage in the learning as well.

When partners were involved, appreciated, and given credit for their role in KNAER projects, motivation increased. Doug stated that a sense of ownership also increases motivation and take-up: "It's very important that teachers can look at the knowledge products and say 'Oh my board was involved in this'." Noah explained that teachers need voices, "a chance to say: 'You know what, that's great in terms of research, but here are some of the things that I see are problematic and I face on a daily basis,' then giving them a venue to share". Other networks experienced challenges in terms of wanting to be more involved, but either did not have the time to get to know their partners, or lacked knowledge of presenting their research in a way useful for practitioners.

      Another challenge for many networks was not motivating network partners, but sustaining the motivation momentum and finding time to come together and work collaboratively. For

example, Cindy commented: "Once we establish relationships, coming up with the time to meet and collaborate that are mutually exclusive for people both working within our project and working in the classroom or on the boards, that's probably the biggest challenge." Some networks utilized incentives to engage practitioners in difficult conceptual work. Incentivization included release time, coaching, mentoring, and access to classroom resources. Incentivizing was not just targeted to end users and practitioners, but also to project leads who were academic researchers. Universities and school boards were encouraged to participate in the KNAER initiative through targeted funding to support KMb. Financial support enabled the purchase of equipment and development of activities and products. Project leaders indicated that funding contributing to opportunities to write and publish was incentivizing. Cody explained:

> We have five papers for presentation in 2013 annual research conference and we received budget pre-approval to cover the travel expense for two presenters to the conference… because of this, we have had broad dissemination, uptake, and implementation of the workshop materials across numerous networks, organizations, and ministries.

Cody's words demonstrate that project leads were incentivized by the possibilities and opportunities surrounding the publication of their network's work in academia and beyond.

**Strategic planning.** The KNAER networks that appeared most successful engaged in a realistic, cohesive, strategic plan with actions to establish and engage network partners in order to enact their network's KMb plans, goals, and objectives. Many KNAER networks ran the risk of creating numerous end products and organizing various opportunities, but doing so in a way where participants viewed the outputs as unconnected or "one-off" events. Some networks strategically utilized products as part of an event that was then subsequently included in other ongoing learning opportunities. For example, Suzanne's network established an electronic structure for engaging a core group of principals with researchers. The interactions between researchers and principals provided opportunities for learning and improvement thereafter, such as online tutorial/training sessions with technical support for new principals. The interactive website is an ideal avenue for collaboration between educational researchers and practitioners.

It became clear that the networks that were most effective were able to coordinate the outputs and activities through a strategic plan to create greater synergy among their partners. Some networks strategically implemented a communication process as part of their strategic plan. Andrea noted:

> The network processes are set up so that the learning from any of the projects actually is intentionally shared... Face to face sessions and then online communication afterwards where we took all the big ideas we were working with, did investigations, and came back together to pool what we were learning and to kind of challenge one another's thinking…

Effective networks require a continuous two-way flow of information with strategic underlying plans that involve evaluating received information and forming next steps. While it is necessary to be flexible when developing plans and changing them as issues arise, it is also important to keep the network's ultimate goal(s) in mind. As previously indicated, having key people or organizations involved in the network was an intentional strategy. However, successful networking takes more than key people; it takes strategic planning to offer the key people the right information and the right direction.

**Discussion**

Our findings indicate that the various KMb networks developed in different ways; some were better at executing parts of networking more than others. Some networks were better at aligning their goals with those of the Ministry while others developed succinct strategic plans or were less coordinated. Even though KNAER purposefully developed project proposals to foster some degree of alignment, we wanted to know how the networks were structured and what network processes were utilized. What became clear to us was that some KMb networks were strong in various structural and procedural aspects of networking, but few were proficient in all of the categories listed in the findings section of this paper. For networks that did come close to demonstrating the structural and procedural aspects of KMb networking mentioned in our findings, a phenomenon of alignment appeared to occur to connect structural components and processes to fulfil network mandates. We highlight the interdependence of network structure and processes because there are many individuals, groups, and stakeholders that form structures that may initially be considered networks, but work more like advisory boards and think tanks that do little in terms of direct action with knowledge mobilization (McCleaster, 2010). A few well-meaning networks came together to brainstorm, engage in discussions, and share information, but experienced difficulty moving beyond this stage of network development. Other groups came together and concentrated mainly on action and the process of "doing something," but were unorganized, unfocused, inconsistent, and failed to reflect and ask some difficult questions such as "What are we doing here?" or "Is there a better way to do this?" When networks aligned their structural components with action, they appeared to have further geographical reach, more outputs, an increased number of partnerships, and possibly a greater impact in terms of mobilizing research-based evidence into practice. Specifically, alignment is more than just the existence of network structures and their processes; alignment refers to the ways in which network members come together to create a synergy that moves the network towards achieving its goals.

One successful example is the KMb network called *Extending the Child and Youth Mental Health Information Network: Sharing Mental Health Information with Educators*. The network was focused on bringing together several school boards who were interested in improving mental health literacy and learning together about research and practice (which also aligned with Ministry priorities). This network comprised multiple key partners, including "The Child and Youth Mental Health Information Network," "E-BEST", "The Ontario Centre of Excellence for Child and Youth Mental Health," and school districts in Ontario. The network included a formal leadership role—the project leader (who was also the KMb Officer at the school board)—who was responsible for forming a professional learning community (PLC) consisting of invited stakeholders and experts. Formal communication and decision making occurred with the network's Primary Investigator and the PLC meeting every six to eight weeks for two years. In terms of co-collaboration and co-creation, the network created brief summaries of systematic reviews, and distributed printed copies of these to PLC members for sharing. The network also hosted a panel of Ministry and community speakers at an annual conference and supported individual boards to develop plans for improving mental health literacy for educators. The network appeared to keep up momentum through motivational strategies, such as connecting educators through a PLC and developing interventions that helped educators understand, identify, and educate children and youth with mental health problems. Network incentives consisted of forming a place to continue the project's efforts for sharing their work with the *Mental Health ASSIST Initiative* through the Ministry of Education. Lastly, optimum performance occurred when the

KMb plan was strategically designed so that all events and products were integrally connected to one another.

## Conclusion

The networks in this study that achieved the most success in mobilizing knowledge in education were those networks that were strategic in aligning their network structures and processes. Factors that contributed to alignment have been identified as structures and KMb network processes, which showed high interdependence and synergy to each other. The identified structures include goals and objectives similar to current government priorities, inclusion of key people and organizations, formal roles and responsibilities, and organized methods of communication. The identified processes involved creating opportunities for collaboration and co-creation of KMb products, motivating and incentivizing, and planning strategically. The networks involved in this study proved in various ways that achieving all these factors is like finding the "sweet spot," a situation or place where a combination of factors results in a maximum response for the given effort. In sports such as tennis or baseball, the sweet spot is achieved when the ball is hit in the ideal place on the racket or bat and results in the most powerful strike, imparting the greatest amount of forward momentum to the ball. Metaphorically speaking, KNAER projects that were even slightly off to the "sweet spot" encountered challenges and resulted in less than the desired amount of success. The metaphor of the sweet spot is relevant to building a successful network; finding the sweet spot is what we feel the networks in this study were trying to accomplish through the alignment of structures and processes to achieve their goals for educational improvement. Finding the sweet spot is challenging, yet not impossible, as demonstrated by these networks. When working at their sweet spot peak, networks are transformative for the institutions and people involved. However, networks are complex and strategic planning for alignment of structures and processes is necessary to find the sweet spot. Based on the findings of this study, KNAER has a deeper understanding of the complexities of how networks work and can assist individual networks with developing capacity and addressing challenges to further the success of their efforts, helping them find their sweet spot.

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# Research Use in Education: An Online Survey of School Practitioners

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## Abstract

*This paper summarizes the results of a pan-Canadian online survey study that investigates the extent to which school practitioners (N = 1,153) use research to inform their practice. The self-reports indicate that the majority of the respondents used educational research, yet this engagement was infrequent. Although the respondents shared neutral attitudes about research, their comments add rather a negative connotation to their perceptions. This study's findings are relevant to school leadership organizations, teacher education institutions, and research-generating bodies as they point to the necessity of increasing research relevance and accessibility, cultivating teaching as a research-based profession, and building school capacity to use research.*

*Keywords: online survey, self-reported attitudes and behaviours, use of research-based information, factors, school practice*

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## Introduction

In the past decades, research on educational issues and practices has generated a rich knowledge base that could be used to improve classroom teaching. However, there has been a persistent lack of a systematic application of the research knowledge to teaching practice (e.g., Organization of Economic Co-operation and Development publications, 2007; 2010). While early studies focused on the use of educational research by practitioners, there has been a recent and noticeable shift towards examining research use as a system property, meaning a coordinated series of actions by organizations to produce, transform, and implement research knowledge to improve both teaching practice and learning outcomes. To emphasize the systemic nature of research knowledge utilization and the multiplicity of agents involved, Sharples (2013) introduced the term "*knowledge mobilization ecosystem*," in which the process of transforming research evidence into actionable knowledge for use is the critical component of the system.

However, this focus on creating and supporting an effective knowledge mobilization system has overshadowed efforts to examine and improve knowledge use by individual practitioners. For instance, Levin (2013) argues: "It is unreasonable and even undesirable to expect individual teachers or principals to be the key consumers of research findings" (p.18). Despite all the importance accorded to research use as an organizational process, it should not be forgotten that the individual teacher remains an agent of change whose actions makes the difference in the classroom.

## Conceptual Framework

The literature suggests that research use is an interpretative process and is affected by more than research information alone. Walter, Nutley, and Davies (2005) suggest that individual characteristics including perceptions, experiences, skills, and social contexts such as organizational settings and broader environments also shape the ways research knowledge trickles down to individual practice. Coburn, Honig, and Stein (2009) specify that "individuals and groups make meaning of evidence in ways that are profoundly shaped by their pre-existing beliefs and practices and day-to-day limits" (p. 86).

Elsewhere Dagenais et al. (2012) have reviewed the empirical evidence regarding potential factors affecting practitioners' use of research evidence. They view research use as a multidimensional construct and draw on the distinction that literature makes between instrumental, conceptual, and symbolic uses. Instrumental use is concerned with the change to concrete practices where research findings are transmitted and applied intact (e.g., Knott & Wildavsky, 1980). Conceptual (Neilson, 2001) or "enlightenment" use (Weiss, 1980) represents a change in understanding or thinking about an issue that affect practice indirectly. Symbolic or strategic use (e.g., Hughes, McNeish, Newman, Roberts, & Sachdev, 2000) relates to using research findings to influence decisions, justify actions, or support a decision that has already been made. Estabrooks (1999) calls for this persuasive use, emphasizing that such use can serve the constructive purpose of legitimizing a position or practice. Although research use may occur for one specific purpose or simultaneously for different ends, conceptual use is argued to prevail over and precede the other two (e.g., Sunesson & Nilsson, 1988).

Relying on the Roger's innovation diffusion framework (2003), Dagenais et al. (2012) group the potential factors influencing practitioner use of research knowledge. At the individual

36

level, they identify (1) qualities of research findings as perceived by the practitioner (opinions) and (2) the practitioner's capacity to use this information for a variety of ends (expertise). At the school level, the factors include (3) the school context and culture (organizational factors) that impact practitioners' openness for learning and engagement with research generated in academia or locally in school-based projects. Finally, the authors identify (4) communication and interaction between the levels of the system and its actors (awareness activities) as a factor affecting visibility and consequently practical utility of research findings. The researchers argue that the power of these four factors to determine and predict practitioners' engagement with research must be taken into account in future studies. In fact, a recent empirical study of research use found that school practitioners' attitudes toward research, and their capacity to engage with it, had the most predictive power on the low and infrequent self-reported use of research (Lysenko, Abrami, Bernard, Dagenais & Janosz, 2014). This paper, which takes educational practitioners as its focus, offers an update on their practitioners' propensity to inform classroom practice with the findings from educational research through the school practitioners' self-reported attitudes and behaviours, gathered by an online, pan-Canadian survey.

## Method

This study is an extension of an earlier project (Lysenko et al., 2014), which was conducted in the narrower context of secondary schools located in disadvantaged areas in a province of Eastern Canada. For this study, the context was broadened to include respondents across Canada teaching in both elementary and secondary schools. The data collection also included the self-reports to open-ended survey questions that were added to the original instrument. While the primary purpose of the study was the validation of the instrument in a broader context, this paper reports the substantive findings with a focus on the qualitative data provided by practitioners.

### Instrument

Data collection was done through the "Questionnaire about the Use of Research-based Information" (QURBI), (Dagenais, Janosz, Abrami, Bernard, & Lysenko, 2008; Lysenko et al., 2014), originally developed to assess factors that affect the extent of research use by educational practitioners. Figure 1 represents the iterative development and refinement of this instrument including pilot testing and large-scale validation.
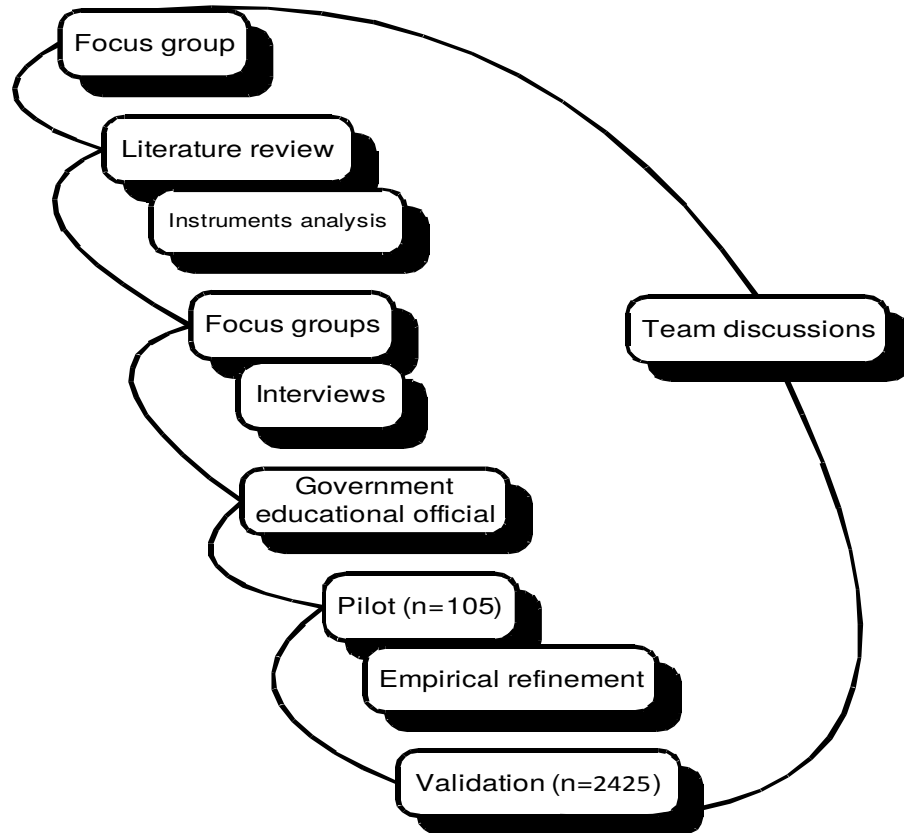
*Figure 1.* Stages of QURBI development.

The questionnaire was validated with 2,425 secondary school teachers. It demonstrated high internal consistency of 0.92. The obtained four-factor structure reflected the conceptual framework and accounted for 17% of the variance in self-reported research use, as well as 22% of three dimensions of use.

The instrument consists of 43 close-ended items. The first set of outcome variables asked about the use of various sources of research-based information (RBI) which was defined as a free-circulating commodity produced by professional researchers such as research teams from universities, external evaluation teams, or by practitioners conducting research in collaboration with researchers produced locally and intended for local use. Specifically, practitioners were asked to report on how frequently in the past year they used research-based information from different sources, such as scholarly documents, professional publications, and websites. The second set of outcome variables examined the dimensions of the use of research-based information in the past year. Instrumental use was captured through items, such as "to improve professional practice" and "to develop new activities, programs." Conceptual use was measured by the following items: "to achieve a better understanding of practical issues" and "to reflect on one's attitudes and practices." Symbolic use was examined through items related to confirming practices or actions.

The factor variables (26 items) were provisionally organized into four sections:

1. Opinions about research — focused on the relevance, timeliness, and reliability of research-based information, as well as its usefulness, ease of access and understanding, and transferability to practice.
2. Individual expertise — examined the importance practitioners attached to the skills needed to access, appraise, and translate RBI to their practice.
3. Awareness activities — referred to practitioners' involvement in research, contact with researchers and knowledge brokers, as well as the way research findings are presented to practitioners.
4. Organizational factors — focused on school culture (supportive environment, the importance of professional development, opportunities to challenge habits and traditions), available resources (qualified staff, facilities and technology, time, incentives), and external influences on individual practices (organized groups, such as unions and granting agencies).

Each section of the questionnaire was followed by an open-ended question to elicit practitioners' comments. Additionally, the participants were encouraged to provide demographic data including gender, teaching experience, education level, occupation category, and grade level. School information including geographical location, size, and language of teaching was also gathered. Finally, the survey elicited reports of previous engagement in research such as coursework in research methods or participation in research projects.

**Survey Distribution**

The English and French versions of the survey were hosted and distributed through the Canadian Council on Learning's online assessment platform. Provincial and federal teachers' unions were contacted to solicit practitioners to respond to the survey. Non-profit educational organizations and provincial teacher colleges were also asked for assistance. While the recruiting strategies were left to the discretion of these organizations, the majority contacted members electronically —for example, through electronic newsletters, e-mails, and websites.

**Analyses**

Standard SPSS procedures were applied to screen data from the 1,611 surveys registered in the online assessment system. After deleting the cases where 60% or more responses were missing, the remaining surveys had missing data imputed by expectation maximization. No univariate outliers were detected. All multivariate outliers were removed, leaving 1,153 cases for analyses that were completed using SPSS for Windows. To compensate for the unbalanced sample, the mean scores were weighted. Answers to open-ended questions were analysed using NVivo 8. Categories of notions with similar meaning and connotations were developed, relying on both *a priori* and *a posteriori* approaches (Leech & Onwuegbuzie, 2011). A Chi-square test of independence was performed for a potential association between the count of categories emerging from practitioners' comments and the frequency with which they used research-based information.

# Results

## Respondents

Teachers were the largest category of respondents (82.1%) whereas school administrators and professional staff represented 8.7% each. Teachers had on average 12 years of teaching experience. Most of the teachers (74%) and professionals (60%) held an undergraduate degree while 54.4% of the administrators had a master's degree. Only 1.3% of respondents had a pre-university education, an undergraduate certificate, or a doctorate degree. In terms of training and involvement in research, 56.3% of respondents reported having taken some coursework in research methods and 57.8% of them indicated they had participated in a research project of some kind. Only 29.3% reported having taken part in school-based research projects. Additionally, the majority of respondents (96.3%) reported being part of the public school system with 33% working in secondary and 77% in primary schools. Only 3.9% reported French as their working language. Forty-six percent of respondents worked in medium size schools (150-500 students). Almost 90% of them worked in schools located in suburban and rural areas.

As Table 1 shows, the respondents were distributed across the provinces and territories. It was Ontario practitioners who accounted for 50% of respondents, with the rest distributed across the provinces and territories.

Table 1

*Distribution of Respondents by Province and Category of Employment*

|                           | Teachers | Administrators | Professionals | Unknown | Total |
|---------------------------|----------|----------------|---------------|---------|-------|
| Alberta                   | 35       | 17             | 4             | -       | 56    |
| British Columbia          | 131      | 1              | 10            | -       | 142   |
| Manitoba                  | 12       | 6              | 1             | -       | 19    |
| New Brunswick             | 142      | 19             | 13            | -       | 174   |
| Newfoundland and Labrador | 4        | 8              | -             | -       | 12    |
| Northwest Territories     | -        | -              | 1             | -       | 1     |
| Nova Scotia               | 16       | 2              | -             | -       | 18    |
| Nunavut                   | -        | 2              | -             | -       | 2     |
| Ontario                   | 521      | 31             | 51            | -       | 603   |
| Prince Edward Island      | 5        | 0              | 2             | -       | 7     |
| Quebec                    | 43       | 5              | 17            | -       | 65    |
| Saskatchewan              | 7        | 5              | 1             | -       | 13    |
| Yukon                     | 1        | 1              | -             | -       | 2     |
| Unknown                   | 30       | 4              | 1             | 4       | 39    |
| **Total**                 | **947**  | **101**        | **101**       | **4**   | **1,153** |

**QURBI Close-ended Questions**

The psychometric statistics obtained in this study corroborated the earlier findings of the survey (Lysenko et al., 2014). Internal consistency reliability coefficients (Cronbach's alpha) were acceptable ranging from 0.77 to 0.92 on the sub-scales and 0.94 on the overall questionnaire. Reflecting the conceptual structure provisionally imposed on the questionnaire, the four-factor solution accounted for 61% of variance whereas each factor explained from 39% to 4.6%.

Survey responses show that each source of research-based information (RBI) was used at least once in the past year (Figure 2). The majority of respondents (85%) obtained research-based information from resource personnel, whereas only 58% referred to pre-service training to inform their practice.
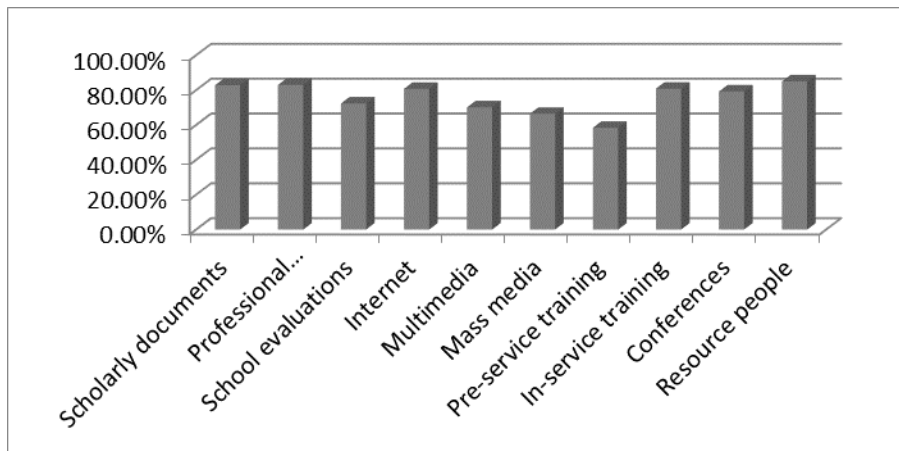


*Figure 2.* Percent of respondents who used RBI at least once for the past year.

The mean scores summarized in Table 2 reveal that respondents were not particularly avid users of sources that would potentially contain research evidence. Respondents reported having used research-based information on average "once or twice during the past year." However, some amount of variation is noticeable in the reports from all ten sources. Respondents reported using online sources (e.g., websites) most frequently whereas pre-service training was rated as the least used. Interestingly, school evaluations were rated the lowest third.

Table 2

*QURBI Weighted Means and Standard Deviations*

| 1. Rate the frequency with which you have used the RBI from the following sources during the last year: 0 – never; 3 – five or more times | Means (SD) |
|---|---|
| Scholarly documents | 1.58(1.08) |
| Professional publications | 1.53(1.02) |
| School evaluations | 1.12(0.99) |
| Internet, web-sites | 1.61(1.13) |
| Multimedia: video, DVD | 1.13(1.02) |
| Mass media: TV, radio, newspapers | 1.09(1.04) |
| Pre-service training | 0.95(1.01) |
| In-service training, workshops | 1.41(0.99) |
| Professional conferences, presentations | 1.26(0.91) |
| Experts, resource people | 1.43(0.95) |
| *Use of RBI composite* | *1.31(0.67)* |
| 2. Rate the frequency with which you have used RBI during the last year… 0 – never; 3 – always | |
| To achieve a better understanding of issues in your practice | 1.53(0.77) |
| To satisfy intellectual curiosity | 1.60(0.75) |
| To improve professional practice | 1.66(0.75) |
| To reflect on your attitudes and practices | 1.47(0.76) |
| To justify or validate your decisions | 1.39(0.77) |
| To resolve problems in your daily practice | 1.22(0.73) |
| To develop new activities, programs, guidelines | 1.57(0.74) |
| *Conceptual use composite* | *1.53(0.67)* |
| *Instrumental use composite* | *1.48(0.63)* |
| *Symbolic use* | *1.39(0.77)* |

*3. Rate the extent to which you agree on RBI…*
*1 – strongly disagree, 3 – neutral, 5 – strongly agree*

| | |
|---|---|
| Is easy to find | 3.12(0.93) |
| Is easy to understand | 3.05(0.87) |
| Is relevant to your reality | 3.39(0.98) |
| Offers timely information | 3.15(0.91) |
| Is reliable and trustworthy | 3.29(0.82) |
| Is useful to guide or improve your professional practice | 3.49(0.96) |
| Is easy to transfer into your practice | 3.08(0.95) |

*4. Rate the extent to which you agree that the following activities are useful to make you aware of RBI… 1 – strongly disagree, 3 – neutral, 5 – strongly agree*

| | |
|---|---|
| Presentation of research findings tailored to your needs | 3.43(0.94) |
| Your involvement in a research project | 3.54(0.95) |
| Research results accompanied by clear and explicit recommendations | 3.82(0.87) |
| Opportunities to discuss research results with the research team | 3.83(0.84) |
| Regular contacts with people who distribute research-based information | 3.53(0.93) |
| Demonstrations about how to apply research recommendations | 3.78(0.91) |
| Discussions of research-based information with colleagues | 3.56(0.91) |

*5. Rate the extent to which you agree that the following skills are necessary in everyday practice… 1 – strongly disagree, 3 – neutral, 5 – strongly agree*

| | |
|---|---|
| Ability to read and understand research publications | 3.91(0.86) |
| Skills to use IT, such as Internet and databases | 4.23(0.79) |
| Ability to assess the quality of research-based information | 3.82(0.89) |
| Expertise to translate research findings to practice | 3.80(0.92) |

| *6. Rate the extent to which you agree that the following organizational factors influence use of RBI…1 – strongly disagree, 3 – neutral, 5 – strongly agree* | |
|---|---|
| Available time to read a journal, apply a new technique, etc. | 4.20(0.83) |
| Available facilities and technology | 3.90(0.89) |
| Incentives, such as remuneration, honoraria, and lessening the workload | 3.31(1.13) |
| Opportunities to challenge established habits and traditions | 3.66(0.89) |
| Organizational importance for professional development | 3.71(0.92) |
| A supportive environment | 3.91(0.86) |
| Human resources, such as the availability of qualified staff | 3.84(0.92) |
| Organized groups, such as unions, granting agencies, media | 2.98(1.02) |

In respect to the ends to which practitioners reported having used RBI, there is a split in their reports on the instrumental use of RBI. Improving professional practices was most frequently reported whereas resolving issues in everyday practice was the least. However, the dispersion of scores on this scale was fairly small. Although mean scores of the observed factor variables gravitate around the point of neutrality, between-factor and within-factor variations in mean scores should be noted. For instance, items relating to research appraisal skills were uniformly rated high. Among these skills, online search skills and the ability to read and understand research were the most needed.  On the contrary, the respondents were most reserved in their opinions about RBI. Their neutrality is noticeable for the following two items: "research is easy to understand" and "research is easy to transfer to one's practice." Considerable disparity in mean scores was observed for the variables pertaining to practice constraints where availability of time to read and apply research ranked as the most influential and the impact of organized groups (such as unions) on practitioners' decision to implement research ranked the least.

Correlation analysis examined the association between the subscales of the questionnaire and demographic variables. Because the use scores were low and not highly variable, the following composite scores were calculated:

    a) use of the sources of research-based information,
    b) conceptual use,
    c) instrumental use, and
    d) symbolic use (Root item was used for symbolic use).

Factor scores represented the four factor subscales including:
    a) practitioners' opinions about RBI,

b) awareness activities,
c) expertise, and
d) organizational factors.

Summarized in Table 3, the coefficients show that variables of job responsibility, coursework in research methods, and participation in research projects positively and significantly correlated with the four composites of self-reported use of research-based information. So did the three factors but not the organizational factors.

Table 3

*Correlations Between QURBI and Demographic Variables*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Use of RBI sources | | | | | | | | | | | | | | | | |
| 2. Conceptual use | 0.66*** | | | | | | | | | | | | | | | |
| 3. Instrumental use | 0.68*** | 0.83*** | | | | | | | | | | | | | | |
| 4. Symbolic use | 0.53*** | 0.71*** | 0.71*** | | | | | | | | | | | | | |
| 5. Gender | 0.04 | 0.05 | 0.05 | 0.06 | | | | | | | | | | | | |
| 6. Experience | -0.01 | 0.05 | -0.05 | 0.01 | -.010** | | | | | | | | | | | |
| 7. Responsibility | 0.15** | 0.16*** | 0.13*** | 0.14*** | -0.11* | 0.13** | | | | | | | | | | |
| 8. Coursework | 0.21** | 0.21** | 0.17** | 0.19** | 0.00 | -0.04 | 0.08 | | | | | | | | | |
| 9. Participation in research | 0.32*** | 0.34*** | 0.30*** | 0.26*** | -0.02 | 0.14** | 0.14* | 0.30*** | | | | | | | | |
| 10. Grade | -0.03 | -0.04 | -0.10* | -0.10* | -0.24*** | 0.03 | 0.06 | 0.03 | 0.05 | | | | | | | |
| 11. School size | 0.04 | 0.02 | 0.01 | 0.04 | -0.11** | 0.03 | 0.00 | 0.00 | 0.03 | 0.33*** | | | | | | |
| | | | | | | | | | | | | | | | | |
| 12. School location | 0.06 | 0.05 | 0.03 | 0.04 | -0.05 | 0.01 | -0.11** | 0.00 | 0.10* | -0.01 | 0.25** | | | | | |
| 13. Language of teaching | -.004 | 0.01 | 0.05 | 0.03 | 0.07 | 0.02 | -0.09* | -0.01 | 0.00 | -0.09* | 0.05 | 0.06 | | | | |
| 14. Opinions about RBI | 0.35*** | 0.43*** | 0.46*** | 0.37*** | 0.01 | 0.06 | 0.11* | 0.07 | 0.20** | -0.04 | 0.00 | 0.04 | 0.01 | | | |
| 15. Awareness activities | 0.20* | 0.26* | 0.22* | 0.19* | 0.05 | 0.00 | 0.19* | 0.02 | 0.13* | -0.05 | -0.02 | 0.04 | -0.02 | 0.00 | | |
| 16. Expertise | 0.16** | 0.17*** | 0.13* | 0.15* | 0.04 | 0.02 | 0.04 | 0.15* | 0.16* | 0.00 | -0.04 | 0.03 | -0.02 | 0.00 | 0.00 | |
| 17. Organizational factors | 0.02 | 0.01 | 0.01 | 0.05 | 0.00 | 0.07 | -0.01 | -0.04 | -0.02 | -0.03 | 0.00 | -0.14* | 0.01 | 0.00 | 0.00 | 0.00 |

**p < .01, ***p< .001

Gender and educational experience as well as all school properties, did not correlate with any of them. Administrators tend to report more involvement in research projects and give higher opinions about research and the importance of awareness activities for their practice than teachers and professionals do. Practitioners who took coursework in research methods reported higher participation in research projects as well as giving more weight to research-related skills. Prior participation in research is also positively related to practitioners' opinions about research-based information, activities to raise their awareness of research findings, and the importance they give to research-related skills for their practice.

**QURBI Open-ended Questions**

The thoughts shared by practitioners through the six open-ended questions represent an important part of this study's data collection. Although many respondents skipped the open-ended questions, nonetheless 504 practitioners commented in some form on at least one of them. The number of comments ranged from 362 (list sources of RBI) to 114 (dimensions of use), with the average being 208 comments per question. The majority of commenters (84.1%) were teachers. It appeared that twice or sometimes three times more comments came from the respondents who reported having used RBI three times or more over the past year. However, we failed to find any significant relationship between the categories that emerged from the comments and frequency of self-reported use, implying that the pattern of individual preferences is likely to be independent of the self-reported behaviour of use of RBI.

In their comments about *the sources of research-based information,* the majority of 362 respondents (91.7%) reported having used RBI from a blend of sources. According to them, it is challenging to choose the source truly based on the research findings as some sources lack a research base. For instance, referring to professional development workshops "resource teachers …do not back up the methods with research. The approach turns out to be 'evangelical', i.e., supporting the latest fad with a lot of fervour, rather than presenting new ideas that are research-based." Collegial exchanges were viewed as a primary conduit of information: "I believe that a teacher is more likely to implement a new practice if it comes from a colleague who has tried it." The respondents rated colleagues the top reference source (55.8%). The preference given to such a casual information flow contrasted with the relatively little importance attached to centralized, formal communication provided by the federal and provincial governments (12.7%), professional unions and associations (6.63%), and school boards (10.5%). Respondents reported using books (48%) more than academic journals (11.1%). In particular, Diller's writing on literacy workstations, Caulkin's works on primary writing, and van de Walle's student-centred mathematics were referred to frequently. Internet was emphasized as an increasingly popular point of access to research findings by the respondents (35.1%). Only 3.6% participants reported having used assessment results or information from university programs. Only 0.8% consulted research databases.

Although only 114 practitioners' out of 362 commented on "dimensions of use," 76.3% of them reported having used research findings instrumentally. This use targeted students and classrooms, school and professional communities, parents and teachers themselves. Practitioners used RBI as a classroom tool for tasks that included helping special needs students, classroom management, increasing student motivation, evaluating student performance, and empowering students in their learning. Conceptual use was reported by 35.9% mainly as a way to support

46

practitioners in setting goals and developing expectations as well as to reflect, make decisions, develop a personal philosophy of teaching, and validate their practice. Reports of symbolic use of research to legitimize actions without necessarily changing practices or taking action were few (4.4%). They pertained to justifying assessment results and curricular decisions as well as persuading parents about a particular course of action taken.

The opinions (N=256) that emerged about RBI were quite critical of the information itself, with criticisms targeting the irrelevance of the research (38.7%). Research was characterized as "Ivory Tower" conducted for "perfect students with no problems, no personal issues" and "never factoring in the different environments, cultures, and socio-economic conditions kids come from." Some respondents complained that the spectrum of RBI is too broad, making it impossible to relate it consistently to classroom situations. Others judged RBI as "narrowly focused" and ignoring "possible or combined reasons for the results." The disconnect between research and practice was accounted for by a number of reasons. Specifically, researchers were described as those who never taught or did it so long ago that "they lost touch with the realities of the classroom" whereas research findings as those that often did not relate to the classroom reality, "the big ideas from the ministry." Furthermore, respondents commented that too much research was driven by U.S. trends, "extrapolating American findings on Canadian practices." A few respondents suggested that teachers' involvement in research would ensure its relevance; for instance, "partnerships involving practitioners in practical research should be favoured."

The methodological quality of educational research was also criticised, including its lack of rigour and unreliable findings. Additionally, reader "unfriendliness" of the research reports (16.8%) "overburdened with catch phrases and keywords that hide the true impact" and a lack of their accessibility for "for quick reading," were another points of criticism. The respondents would need short and clear reports incorporating "actual examples" as well as summaries and syntheses with "a ballpark figure to gauge effectiveness." Also clear, strategic, and comprehensive recommendations should be provided to guide practice. Some reported that a limited ability to understand research, especially statistical data, might account not only for the negative perception of RBI, but also for poor utilization and misuse of the information. Practitioners suggested that pre-service and in-service education should be venues to develop the skills to read, interpret, and relate research results to teaching practice.

The physical inaccessibility of research data also discourages practitioners from using it in their practice (12.9%). Many practitioners do not have access to online libraries and databases. Those who have access reported having some contact with universities, being university students, or maintaining contact through their previous jobs. Practitioners living in remote communities do not have adequate access. Some practitioners must rely on "hard copies of the out-dated research papers distributed at school and school board" as their only sources of RBI. In this respect, timeliness of research are also a concern.

Few respondents (7%) produced balanced appraisals of RBI. For instance, RBI is described as "sometimes far-fetched, sometimes relevant and credible." According to them, practitioners' opinions about RBI "depend upon the research and who did it."

Even if RBI is accessed, read, understood, and found relevant, there are a number of practical challenges to its systematic use in the classroom (12.5%). Lack of support and resources, large classes, lack of time to plan for changes and to modify the information to meet students' needs, and the mere stress of the day "often cause practitioners to lapse into a more

47

traditional pedagogical method because it offers the path of least resistance, not because it is best practice."

Comments on "activities raising awareness" of research findings (N=192) emphasized the importance of demonstrating how the findings of a particular study can be used in classroom practice (26.7%). To be useful, these demonstrations should reflect classroom reality and show how findings can be incorporated into practice seamlessly. Practitioners reported they would also appreciate lesson plans and assessment tools based on research findings. These plans and tools could be incorporated into workshops and seminars delivered in person or as video clips via the Internet. For instance, 20% of the respondents suggested an open-access meta-resource, "access point," "tool box," "resource bank," or "central list of research," consolidating summarized or synthesized applied educational research. As a longed-for tool to improve school practice, this resource would be accompanied by clear recommendations and demonstrations and structured by subject or problem areas.

Comments on *expertise needed to use RBI* (N=143) ranged from skills and individual dispositions to external support and expertise. A key set of abilities included information search skills (9.6%), research appraisal skills (20.6%), expertise to relate and adapt research results to practical context (20.6%), abilities to summarize and communicate available research findings (6.2%), and abilities to conduct one's own research (6.2%). The importance of external support was mentioned by 27% of respondents. They need the presence of a "more knowledgeable other" (expert) who can work well with teachers and other practitioners to discuss and explain research, to summarize and translate ideas that are relevant to teachers, to demonstrate the usefulness of findings in a classroom setting, and to provide tools and resources to help apply RBI in a particular situation.

Among the reported "organizational factors" (N=177), lack of time was an important barrier to practitioners' decision to use RBI (26.4%). Time is needed to search out sources and then read, understand, reflect, and incorporate ideas into practice. Some suggest that such time should be formally allocated in job contracts or assigned by school administrations or school boards. Others propose time-saving strategies and demand ready-made materials: "Just provide the data and the appropriate lesson plan, and I am in." Others feel that the using research is part of their obligation to students: "I can't wait until the powers decide when it will be the time. Nor can I use the excuse of time, or other reasons not to explore my teaching."

Support and encouragement were reported as another critical need (52%). School practitioners count mainly on school administrations for support (27.7%) as they "can allow time," "encourage team meetings," and "promote a safe working environment for research inquiry." However, the use of RBI should become a priority for school leaders: "Emphasis and priority on research-based information need to start with school administration to effectively filter down to teachers." There is possibly only a fine line separating engaging and encouraging initiatives from authoritative force and pressure. As a result, some practitioners develop resistance to the top-down approach: "Research that I am told to use makes me resist . . . I use research when I feel it will be useful to me, not when someone else pressures me."

As well, proactive leadership needs to be combined with the effort of the school community to contribute to a spirit of research-based school practices. Respondents mentioned a "critical mass of people" who could unite colleagues doing research or who are involved in successful implementation of research findings (13%); support from school boards (11.3%), professional unions and governments (10.7%), and parental support (3.9%).

48

A number of respondents (12.4%) also mentioned that political and ideological agendas pursued by governing bodies at various levels do not usually take proper account of RBI. Some reported conflicts that emerged when educational groups and organizations pushed information based on their priorities, and ignored or hampered practitioners' initiatives to use research findings relevant to their teaching practice. It is even more complicated when the expectations and requirements of ministries and boards clash; practitioners strongly oppose getting involved in such a "battle of dueling experts."

**Discussion**

The data collected in this online survey shows that use of RBI by individual practitioners continues to be a challenge. In accordance with previous findings (Bérubé, 2005; Kretlow & Helf, 2013; Williams & Coles, 2007; Lysenko et al., 2014), practitioners' self-reports are marked by low-threshold use. Despite this infrequent use, our data did reveal a pattern of sources used, hinting at the nature of information favoured by school practitioners. When compared with previous findings (e.g., Williams & Coles, 2007), the number of practitioners who use the World Wide Web for sources has increased, with practitioners commenting on the Web's ability to give relatively unrestricted access to information. Also remarkable is the importance given to peer exchanges of practice-relevant information, with the open-ended reports implying that colleagues (both near and far) are a primary source of information.

However, Internet sources and collegial networking may not always have a foundation in research findings. For instance, despite the fact that a number of practitioners referred to governmental, professional, and school board Web sites and electronic databases as their major sources, others reported their reliance on blogs, general search tools like Google and Yahoo, and social media platforms. Schneider's (2008) qualitative study of "edubloggers'" online training practices suggests that rarely did these bloggers validate their content, indicate references, or even take any training courses. While collegial networking can bring research to the front lines of educational practice quite quickly, the quality of the "word of mouth" stratagem should not be over-estimated either. Davis (2008) argues that these accounts of research are often truncated, decontextualized, and blended with anecdotal experiences of the colleague, rendering them largely inaccurate.

Contrary to the argument that practitioners are more prone to use local data, which they value for its contextual relevance as opposed to the research generated in academia, the self-reports revealed low use of school evaluation data. Only 6% of commenters mentioned that assessment data informed their teaching. Whether the data are accessible or usable for making individual or collective decisions is unknown. However, the comments suggest that these contextually relevant data do not often trickle down to the interested teachers.

It is important to note that respondents rarely referred to teacher education programs as a source of RBI. According to Cousins and Walker (2000), only novice practitioners refer to teacher education programs to compensate for their lack of experience. In our sample, only 17% of respondents had less than three years of experience, and there was no observable relationship found between teaching experience and the use of RBI. Consistent with the literature (e.g., Cousins & Walker, 2000), coursework in research practice as well as prior participation in research projects were associated with the self-reported use of research-based information. On the one hand, this link implies that the effects of formal training in which research practice is

49

incorporated are likely to stay with practitioners. On the other hand, research experience gained in their workplace through participation in research projects may also increase teachers' engagement with RBI.

In terms of how practitioners use RBI, the self-reports suggest predominantly instrumental uses. However, respondents would rather use RBI for the broader purpose of improving professional practices than for finding solutions to everyday issues. It is possible that the research findings aren't presented in a way that offers answers to specific issues of practical concern or perhaps practitioners are simply used to going elsewhere (e.g., to colleagues) to find a quick fix.

Although existing studies report that educational practitioners express positive attitudes towards educational research (e.g., Ratcliff et al., 2005; Williams & Coles, 2007), the respondents in this study took a neutral stance and we can only speculate about the reasons for their position. Research knowledge utilization has become a buzzword in education and practitioners might feel obliged to hide their negativity about the value of educational research to conform to the prevailing winds. This supposition receives support from the negative comments made about RBI, namely that research isn't rooted in school reality, is often irrelevant, is difficult to access, and contains convoluted language. The fact that these comments were given by the respondents who reported having used research should raise the red flag to communities engaged in research production and dissemination, including universities and research-brokering organizations inside and outside the school system.

Both the qualitative and quantitative data reveal the importance practitioners attribute to the potential of research to improve practice. They gave clear and explicit requests for research publications to offer more specific recommendations for applying research findings to practice. Practitioners valued professional development activities as a way to raise awareness of RBI. They suggested information literacy skills together with the ability to appraise and act upon research evidence combined with a willingness and openness to change as being critical for the use of research to inform classroom practice. At the same time, the availability and accessibility of external expertise to help with basic understanding of research and its adaptation and application was also valued. Practitioners noted the importance of structural support, especially time and collaboration, in the successful use of research knowledge. Time especially was identified as essential for searching out sources, reflecting on the material, and incorporating ideas into practice.

## Conclusions

Although the selected research methodology has limitations such as correlational design, self-reports, and non-probabilistic sampling, several lessons can be gleaned from this study, particularly about the need to cultivate positive attitudes toward and capacity of research use. Firstly, teacher education programs can help practitioners develop a solid foundation in the skills needed to engage in and with research by formulating questions, finding solutions by searching for and appraising existing information for appropriateness, applying the information, and evaluating its effectiveness. Teacher programs should balance courses in curriculum and instruction with systematic inquiry activities and classes that emphasize the practical value of evidence generated from research. Ideally, professors should communicate an interest in pedagogical and education research to underscore the importance of such research in informing

50

classroom practice. Secondly, a more systemic approach is needed to ensure that using research-based information is not abandoned once novice practitioners enter the school system. Research-based information should be readily accessible to busy practitioners and decision makers. There needs to be a "place," a public resource where such information can be brought together, assessed for quality and relevance, and then organized for professional use. Effective models for condensing research-based information and communicating it to educational professionals can be found in the health and social care fields. Similarly, expansion of research brokering organizations as intermediaries between educational research and practice may stimulate research use by their capacity-building functions, implementation support, organizational development, and policy influence (Cooper, 2014). Finally, there need to be structures in place to support the practitioner. These structures should: (a) provide access to research that is written for non-scientists and accompanied by clear recommendations and demonstrations on how it is to be effectively applied, (b) integrate on-going research-based professional development, (c) create opportunities and stimulating intellectual needs to share experience gained in research implementation, and (d) put in place administrative and managerial support structures for the time and energy required.

　　In sum, this research suggests that there is a way to go to ensure that knowledge generated by educational research routinely informs educational practice. Systemic and coordinated efforts by those on both research and practice sides—including school boards, education faculties, and knowledge mobilization agents—are required to build the school capacity structure and enable teachers to be key innovation agents whose teaching makes a difference at the end of the day.

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53

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# Exploring the Benefits of a Collaborative Inquiry Team in Education (CITE) Initiative to Develop a Research Community and Enhance Student Engagement

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## Abstract

*This study examined a collaborative inquiry process, facilitated by university faculty in an elementary school, intended to develop a research community, foster knowledge mobilization, and enhance student engagement. The Collaborative Inquiry Team in Education (CITE) initiative consisted of five school-based sessions that included videos, discussions, and the completion of a research action plan. Data collection and analysis involved sessions' transcripts, feedback from participants, documents such as brainstorming charts, and student artifacts. Findings indicate that the collaborative inquiry process with enablers of time, flexibility, and support from university faculty increased educators' research acumen and student engagement in classrooms. The CITE initiative is an effective example of applied education research and knowledge mobilization with the inclusion of faculty and technological support, innovative resources, and the co-construction of new understandings.*

*Keywords: collaborative inquiry, school-university partnerships, educational research, knowledge mobilization, student engagement, teacher engagement*

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## Introduction

The Ministry of Education (MOE) in Ontario has undertaken some initiatives to support the development of a community of educational researchers among stakeholder groups who work with students in teaching and learning organizations. For more than a decade, the MOE has recognized the importance of research for educators and has instituted a *Research and Evaluation Strategy,* fostering collaboration between partners in education. The annual *Ontario Education Research Symposium* (OERS), held since 2005, and the *Knowledge Network for Applied Education Research* (KNAER) grants which began in 2009 are evidence of the government's commitment to educational research and knowledge mobilization (KMb). In the MOE London region, the *School Board-University Research Exchange* (SURE) Network was formed as a partnership among school board personnel and university faculty. SURE members have been actively engaged in a range of initiatives to encourage KMb and collaborative educational research among school board and university partners. These initiatives include joint conferences, publications, and the development of media productions such as the SURE Network's (2014) *Research to Practice* video series sponsored by a *Social Sciences and Humanities Research Council* (SSHRC) Connection grant. The Ontario Ministry of Education (OME) has also provided the *Capacity Building Series* and the *Ontario Education Research Panel* (OERP) publications describing the collaborative inquiry process (OME, 2016). These documents, developed over many years, reiterate the need for building mutual interest, respect, and trust among educators and researchers, as well as the commitment to a flexible research design in education-related collaborative inquiry initiatives.

This paper describes a study examining an initiative implemented to actively engage educators of a school in the Waterloo Catholic District School Board (WCDSB) in professional development, research, and KMb activities through the formation of a Collaborative Inquiry Team in Education (CITE). The CITE initiative was led by two university faculty members who had previously worked for the WCDSB and one had served as a co-chair of the School Board-University Exchange (SURE) steering committee for two years. CITE was comprised of a series of collaborative inquiry sessions to promote education research and to address challenges outlined in the school's improvement plan. The CITE initiative utilized a variety of resources including the video series developed by SURE (see http://www.surenetwork.ca/). These videos were produced by SURE as knowledge mobilization tools, and in this study, were hypothesized to foster research acumen among the CITE school participants and to stimulate the collaborative inquiry process. The CITE participants became interested in reflecting on their practices and pedagogies to promote such areas of student engagement as resilience, persistence, independence, and self-efficacy. By examining their school's third and sixth grade provincial assessment data, the CITE school participants determined that increasing student engagement was a "challenge of practice," requiring increased attention and purposeful strategies. The overall collaborative inquiry focus became improving student engagement through effective instructional strategies.

The design of the collaborative inquiry was tailored and developed to address the emerging inquiry questions of participating teachers and the learning needs identified through their school's improvement plan. KMb was fostered through the partnership with the university faculty and the utilization of the SURE video resources. The initiative was based on the *applied education research community* theoretical framework (Martinovic, Wiebe, Ratković, Willard-Holt, Spencer, & Cantalini-Williams, 2012).  The teacher as researcher concept, with faculty of

57

education support, was explored and actualized through this framework. The initial goal was to involve teachers in a professional development and research-based endeavour with the authentic purpose of facilitating KMb and enhancing student engagement and learning.

## Literature Review

Teachers as researchers have a unique opportunity to bridge the gap between theory and practice in ways that benefit teacher knowledge, contribute to life-long learning, and empower teachers to question and improve current educational practices (Kyei-Blankson, 2014). Collaborative inquiry models allow teachers to become a part of a community of researchers, addressing educational issues and building on the individually-based action research model (Hannay, Wideman, & Seller, 2010). Teachers have been found to be ideal researchers as they are insightful and knowledgeable in regards to current teaching practices and student needs (Blakemore, 2012). Such research with teacher involvement is suggested to be a valid and valuable method for gaining a deeper understanding of educational issues in today's classrooms (Hine & Lavery, 2014).

Collaborative inquiry includes teachers as crucial members of an information culture in education (Williams & Coles, 2007). Initiatives to support collaborative inquiry teams within the educational setting help establish knowledge and create schools that lead to improvements in current teaching practices (McIntyre, 2005). Partnerships have proven to be especially successful when universities, schools, and teachers work in collaboration to conduct meaningful research about current educational issues (Gore & Gitlin, 2004; Kyei-Blankson, 2014). In addition to collaboration, such elements as communication, commitment, and continuity of the research team are also important to the success of such research programs (Ponte, Beijard, & Ax, 2004). Kuntz, Presnall, Priola, Tilford, and Ward (2013) found that classroom research fosters a sense of agency and ability within teacher researchers. Teacher researchers are often empowered by their new dual-role (Kane & Chimwayange, 2014) and able to decrease the divide between knowledge construction and knowledge mobilization.

Collaborative inquiry teams are a successful method of gaining and mobilising important information about educational issues (Blakemore, 2012; Gabriel, Doiron, Baldacchino, McKenna, & O'Keefe, 2012). Gabriel et al. (2012) conducted a qualitative research study and examined several educational issues including mixed-age groupings, initiative approach learning, and integration of literacy in other curriculum areas. Their findings indicated that engaging and supporting teachers as researchers were effective means of improving educational practices. Additionally, the authors found that the teachers were interested in continuing their research as the research project provided a rich learning opportunity that would not have been otherwise available to them. These findings indicate the value of collaborative inquiry and a research culture that supports teachers as researchers in addressing important issues in their field.

In a seminal work on KMb, Cooper (2011) found that KMb is an effective strategy for the exchange of knowledge between academic research and professional practice. Recently, Cooper (2014) examined KMb efforts and noted that only a small percentage of researchers used online strategies for dissemination and discussion of their information. This utilization of technology for KMb, or more specifically for collaborative research and inquiry, is a new phenomenon that merits further study and has been included in the CITE initiative. Collaborative inquiry models where teachers experience the dual role of teacher and researcher within a

collegial culture of inquiry may help bridge the gap between theory and practice in meaningful and authentic ways.

The theoretical framework for the exploration of the CITE initiative is based on the findings of a large-scale study exploring teachers' perceptions of education research (Martinovic et al., 2012). In this Ontario-based study, education research was viewed as demonstrating evidence of success when collaboration is utilized and teachers feel empowered to engage in first-hand research (Martinovic et al., 2012). The study participants (i.e., teachers across various school boards and elementary/secondary panels) identified benefits, enablers, and challenges for those educators who are involved or interested in research.

Based on the applied education research community framework (Martinovic et al., 2012), the elements and enablers described as necessary for effective collaborative research initiatives were integrated into the CITE initiative. The CITE initiative is an example of the *Applied Education Research Community* (Martinovic et al., 2012) because it is collaborative inquiry characterized by ethical review, research questions and methods, data collection and analysis, dissemination of findings, and potential improvement of teaching and learning. Various challenges as outlined in the described framework were also identified and addressed in the processes of CITE. Additionally, the concept of KMb described by Cooper (2011) provided a lens for understanding the co-creation and exchange of understandings across academic and practitioner communities.

To engage teachers in research processes and KMb, especially through a collaborative inquiry team approach, university faculty are hypothesized to be instrumental in this process (Martinovic et al., 2012). In Ontario, there is a call for academics and practitioners to work together by sharing ideas and addressing common educational issues, yet there is little research on the role of university faculty in guiding collaborative inquiry teams. The CITE initiative was created to address this research area through faculty facilitation of a school-based inquiry. The use of KMb strategies, collegial and technological support, and a structured format for knowledge exchange were expected to increase positive perceptions of the collaborative inquiry process and to foster teacher and student engagement.

## Methodology

The methodology of this research project is similar to that of the collaborative self-study conducted by Grierson, et al. (2012). Grierson et al. (2012) collected data from a range of sources such as participant questionnaires, transcripts of group discussions, and related artifacts. The authors found that participating faculty who documented their discussions and perceptions in relation to teacher education over a series of sessions, not only learned about their respective roles and tensions as teacher educators, but also formed a professional learning research community. Kitchen, Ciuffetelli Parker, and Gallagher (2008) also documented the benefits of collaborative self-study as a form of faculty development, highlighting how it promoted engagement in authentic conversations.  Latta and Buck (2007) found that there are potential risks and opportunities in a collaborative self-study, yet it is a valuable vehicle for professional development. Reflection was a major component of the CITE initiative, as Leigh (2016) reported, that reflexivity implies individuals take time to reflect on and analyse their actions and awareness of themselves, and then use those insights to improve their practice.

The present study is a form of collaborative self-study designed to address the following research questions:

1. How does the collaborative inquiry process facilitate participants' awareness of and interest in the research process?
2. How does the collaborative inquiry process create a community of educational researchers?
3. How does the collaborative inquiry process contribute to increased competencies and changes in pedagogical practices?
4. How did the CITE initiative enhance student learning and skills?
5. What are the enablers and challenges to developing collaborative inquiry teams in education?

This study included the implementation of a series of five collaborative inquiry sessions over a 5-month period with a total of eleven participants including the two university faculty facilitators. The data was collected by a university student research assistant throughout the series of collaborative inquiry sessions. The sessions included such agenda items as viewing videos, engaging in team activities, discussing instructional practices, and reflecting on evidence of student learning.

**Context and Participants**

The setting is a school within the Waterloo Catholic District School Board. It is a mid-sized school with a diverse socioeconomic population and below average scores from *Education Quality and Accountability Office* (EQAO) assessments. There were nine school board educators who volunteered as members of the collaborative inquiry group and they all agreed to participate in the present study. Six of the participants were classroom teachers and represented a cross-section of grade levels, ranging from Grades 1 to 7. Other participants included the Board Student Work Study (SWS) teacher who assisted in setting up the CITE initiative, the Literacy/Numeracy resource teacher and the school principal who all attended each session as active participants. The two faculty facilitators of the CITE initiative planned the sessions and led the discussions.  They participated fully in the collaborative inquiry, but their comments are not included in the data and findings which include only the perceptions of nine school and board personnel.

The classroom teachers received release time from a board budget to participate in the CITE initiative. Some of the teachers had previously worked with the SWS teacher, who invited them to participate in the CITE initiative; others responded to an email invitation sent to all teachers by the principal. The collaborative inquiry team participated willingly in this professional development and research project to increase their understandings of educational research and to enhance student learning. The Nipissing University Research Ethics Board and WCDSB provided research ethics clearance for the study.

**Data Sources**

A qualitative approach to data collection and analysis was used. The three main sources of data were transcripts of discussions, school board participants' feedback forms, and artifacts created during session activities. A discussion portion of each session was audiotaped to gather participants' perceptions of the benefits and challenges encountered in the research process and to identify new learnings related to pedagogy and practice. These discussions usually took place

after watching SURE videos, developing goals/theories of action, and reviewing pedagogical documentation.  Feedback forms were completed anonymously by each participant at the end of each session to allow for reflection and to document examples of learning, and submitted to a research assistant. Various documents such as discussion charts and action plans were created at every session. These artifacts were collected to provide evidence of participant learning.

**Data Collection**

At each CITE meeting, all nine school board participants and two University faculty members were present. The meetings were held for approximately three hours in a school seminar room, with Internet access and group table arrangements. The five sessions included purposeful scaffolding of learning and exploration. Each session began with a review of the agenda and ended with the completion of feedback forms by the participants.

The first session was of an introductory nature to familiarize participants with the goals of the CITE initiative and to identify teachers' initial perceptions towards research. The discussion following the viewing of a SURE video (*Thinking Like a Researcher*) allowed some unpacking of concepts and terms related to teacher research. This video also was intended to teach participants about SURE's KMb efforts. Various documents developed by the Ministry of Education such as the *Capacity Building* and *Research into Practice* series were shared with participants and provided a basis for a common understanding. The school principal, as requested by the facilitators, described the main challenge of practice as outlined by the School Improvement Team after a review of the 2014 school provincial assessment data. The CITE participants determined that student persistence in task completion was central to improving student engagement and learning across grades and would become a focus of the collaborative inquiry sessions.

In Session 2, a review of the first session activities served as a reminder of  CITE goals and the SURE video on *Collaborative Inquiry Models* provided many examples of collaborative research conducted in local school boards. In this session, participants became familiar with a template termed a *Research Action Plan* as introduced by a corresponding video describing the cycle of inquiry. Participants were asked to begin to determine their area of focus within the overall CITE school-wide inquiry question: How can we foster an environment that is conducive to productive engagement for learning?

In Session 3, the participants worked in small groups or pairs to complete their Research Action Plan with an outline of their goals, strategies, resources, data sources, and potential evidence of learning. Teachers refined their classroom focus areas into educational goals such as improving student perseverance to work through challenging problems and demonstrating increased levels of accountability and independence in the learning process. The resource teachers and the principal assisted the classroom teachers to brainstorm possible strategies to address these goals. Teachers became more familiar with the term pedagogical documentation and use of data by viewing a related MOE video on pedagogical documentation and the SURE Video: *Research to Practice: Forms and Possibilities*. Between Sessions 3 and 4, the classroom teachers implemented instructional strategies related to their area of inquiry such as the use of checklists, rubrics, and focused activities.

In Session 4, the participants began to explore the potential of using a school-based learning management system operated by the Desire 2 Learn (D2L) company, and utilised by WCDSB, to post the CITE materials online and to encourage discussion among participants. One

teacher was particularly helpful and invited all participants to this site. At this session, OME documents *What Works? Research into Practice* related to resilience, poverty, and KMb were distributed for discussion. The fourth session was also used to review the project progress and to prepare for a workshop that this group had collectively agreed to facilitate at a SURE conference in London, Ontario on April 30, 2015. Some time was spent on determining content and roles for that workshop facilitation.

The fifth and final session included a sharing of CITE participants' learnings and the classroom teachers showed their pedagogical documentation, such as student work samples, as evidence of students' progress and persistence in learning activities. Participants expressed their perceptions of using D2L for the initiative and discussed expanding this process to include other teachers in their school, and possibly extending the initiative to a nearby partner school.

**Data Analysis**

The session transcripts, feedback forms, and session artifacts were analyzed using inductive thematic analysis techniques (Charmaz, 2006; Guest, Namey, & Mitchell, 2013). This approach involved simultaneous data collection and analysis, coding, constant comparison of codes, identification of emergent themes, memo-writing about category and theme development, and iterative analysis (Charmaz, 2006). Strategies for analysis from Miles and Huberman (1994) were also used in the analysis stage including display of findings, and drawing and verifying conclusions.

The two university researchers and a research assistant examined the transcripts, the feedback forms, and the documents to categorize the information gained from the participants and their discussions. Emergent themes were developed into a model with interrelating categories to inform a theory that further explores the process of collaborative inquiry and supports the proposed framework of applied educational research (Creswell, 2009). The intent of the data analysis was to identify the participants' perceptions of collaborative inquiry in education. To ensure the robustness and rigour of the analysis process, the research team included two university researchers and a research assistant who collected and co-analyzed data, used data triangulation, and offered participants the opportunity to member check session transcripts and main themes.

**Findings**

To determine the findings of the present study, the data collected was analyzed according to the five research questions. The participant feedback, available in both oral and written form, was analyzed, along with an analysis of documents such as participants' Research Action Plans and artifacts of student work.

1. **How does the collaborative inquiry process facilitate participants' awareness and interest in the research process?**

The participants felt strongly that the CITE process was extremely beneficial to increase their awareness of the MOE position on educational research and collaborative inquiry. Most participants were not aware of Ministry direction, yet had a moderate comfort level with research protocols and processes before the CITE initiative. None of the participants, except one, were

62

aware of the SURE network, the related website, events, and resources. When asked how confident they were with determining a research topic and collecting evidence, most participants reported that they were moderately comfortable with these steps in the research process. Fewer participants had familiarity with developing research questions and writing a summary report or an article on the findings. Participants were open minded about the CITE initiative and embraced it even though the purpose of the initiative was initially unclear to them. One participant said in the first session: "I found today very useful and am looking forward to embarking on this research initiative," and another reported: "My mind was thinking in a way that engages me." .After involvement in several sessions, one participant reinforced the value of the collaborative inquiry process as a means for reflection and action research stating the following: "It was very helpful to go through each step in the research process and apply it to our area of focus." Another participant noted that the SURE video resources were helpful: "The SURE videos provided real examples of collaborative research. They showed us that research can be easily conducted within a classroom setting."

The classroom teachers appreciated the collegial atmosphere for learning and the opportunity to work together with a common research focus. One teacher noted: "I enjoyed seeing it in action with other colleagues." The teachers learned about the research process as they experienced it as researchers and participants. One teacher said quite emphatically: "I need to have a connection to the research. It needs to be related to my teaching; otherwise, I am not interested." Many commented on the continuous need to revise and reflect on their thinking throughout the research process. A participant in the study said: "I appreciate the ability to gather results/change techniques and tweak strategies," and another noted: "We are recognizing that we need to take the time to really dissect the question and focus before we take action."

The data from the feedback forms and discussions indicated that participants embraced the research experience fully through the collaborative inquiry process. They used terminology related to research such as "research questions," "gather results", and "focus strategies." The participants were very excited to learn that other teachers had also been involved in collaborative inquiry processes with university facilitators as had been demonstrated in the SURE videos. They were especially looking forward to the opportunity to share their research at the SURE conference. Some participants were also very interested in co-authoring the present article.

Attending the SURE conference was an opportunity to reflect on new understandings and develop an interactive workshop. Six teachers were able to mobilise knowledge created through CITE by presenting their preliminary findings to educators and peers from across the province. In the summary session after the SURE conference, the presenters reported that people in the session appreciated the validity of the front-line teacher perspective. One teacher stated that "participants in our session became most interested when we talked about our data and when we mentioned the use of D2L as a research site." Teachers' involvement in both the CITE sessions and in the presentation at the SURE conference increased teachers' awareness and interest in research and KMb processes.

## 2. How does the collaborative inquiry process create a community of educational researchers?

The CITE initiative provided teachers with an opportunity to work together in a research-focussed environment, with faculty facilitators and administrative support while remaining on their school site. This was a new experience for many participants allowing them to increase

63

awareness of their colleagues' interests and educational issues. The participants clearly articulated the new realization that others had the same challenges and questions as they had in their classrooms. One teacher noted:

> I really like the time we were able to show what our concerns were as [we] were trying to gather questions for potential research. Hearing that other teachers are experiencing the same things I am feeling assures me I am on the right track.

Another teacher commented: "Sometimes my mind wonders at 100mph while I am here. But I love how I am thinking about my practice." The participants were particularly appreciative of the time and space that allowed them to discuss, share, and reflect on ideas as indicated by one participant: "It's always useful working with colleagues as it allows us to share ideas about students we are familiar with, and possibly will work with in future years." The collaboration and support, evident in the group, provided a safe setting for generating potential solutions to school-wide issues: "Being able to discuss strategies and next steps for our students in a collaborative setting is helpful." Participants were thankful for having the educational and human resources, such as faculty, the SWS teacher, and the principal at the meetings and they wanted more such opportunities: "Would love to meet more people who are stakeholders in their learning."

The participants in this study expressed positive feedback about the opportunity to meet in a collegial setting with university faculty and board support staff to discuss common concerns and challenges. One participant stated: "Love the partnership and the professionalism." while another participant explained: "Working with peers (teachers, principal, board staff, and university faculty) has been an insightful experience. The outcome of being involved and learning from others has been beneficial to my teaching practice." Participants appreciated the professionalism and intellectual focus of the experience. Some participants liked getting to know their colleagues and also being supported in acknowledging that some strategies may not yet have worked: "Collaboration allowed us to discuss 'what worked' and the power of 'not yet' in order to improve our strategies."

3.  **How does the collaborative inquiry process contribute to increased competencies and changes in pedagogical practices?**

The participants were grateful for learning new teaching skills and strategies. They were affirmed in their practice and had the chance to hear about new approaches from peers and fellow participants. One participant noted: "The discussion and sharing ideas were the most valuable piece for me. I feel more confident in my abilities to achieve the goals I have set for my students." For some participants, this was the first time that they had reflected on how their classroom teaching might affect outcomes of the provincial assessments of Grades 3 and 6. One teacher stated: "I've thought more about my practice than I ever had before. How do I improve scores?" Statements such as the following attest to the perceived value of involvement in the collaborative inquiry process: "The research initiative has allowed me to self-reflect on my own teaching practices and how to improve student learning," and "I am able to take time to critically reflect on my student learning and WHY they learn." Participants were grateful to have the time and impetus to focus on their professional learning and specific goals to improve student

achievement. The classroom teachers tried many new strategies generated through group discussions to achieve the goals of the collaborative inquiry process.

### 4. How did the collaborative inquiry initiative enhance student learning and skills?

The changes in student learning and engagement related to persistence and task completion were demonstrated through teachers' reports on indicators of success outlined in their Research Action Plans. The participants had collected pedagogical documentation and data, such as work samples, student comments, time on task measures, photos, rubrics, and other artifacts. Teachers indicated that there were marked improvements in: students' ability to stay with a challenging task, quality and quantity of writing samples, completion of mathematics questions with supporting evidence, levels of self-regulation, focus during meditation activities, and positive attitudes towards difficult assignments. Some of the teachers' comments included: "Evidence was good...physically seeing the progress of the students," and "Awareness is the key and reflecting on my practice has contributed to making changes to my teaching strategies. I have also noticed my students have gained a greater awareness of the importance of independence, persistence, and grit."

The following examples describe indicators of success as reported by educators in the Research Action Plans according to the two main inquiry focus areas.

**Inquiry Focus: Students improve perseverance and grit to complete tasks and increase stamina**

   **Indicators:**

- Homework completion improved overall;
- Less student reliance on teacher support;
- Greater number of students willing to share work;
- Increased time spent on independent work;
- Quantity and quality increased in choice assignments;
- More task completion in class;
- Increase of work focus from 8 minutes to 20 minutes; and
- Students created their work list every day, which resulted in less unfinished work/homework.

**Inquiry Focus: Students demonstrate increased levels of accountability and independence in the learning process**

   **Indicators:**

- More ownership in reviewing work before handing it in;
- Increased pride in the draft process of writing and seeing it as a continuum of learning;
- Begin to use the newly introduced rubric for their other activities in class;
- Started showing initiative by requesting the teacher for conferencing;
- Students acknowledged times when they were stuck verbally using the phrase "My brain is on fire," with a positive attitude;

- More persevering and engaging in difficult tasks without giving up;
- Demonstrated improvements in writing quality and writing productivity;
- Increased confidence in skills and abilities by striving for higher levels of achievement;
- After "Christian Meditation" sessions, the students showed increased levels of focus and acts of kindness;
- Increased levels of self-regulation and self-direction in task completion; and
- Reported ability to celebrate "not yet" as a means of bumping up their work.

These reports from teachers are clear indicators of improvements in the areas of persistence, focus, confidence, task completion, and self-direction. Overall, the classroom teachers noted increases in positive behaviours and less disruptive behaviours, indicative of students' greater self-esteem as learners. Students embraced the instructional strategies encouraging them to be independent and confident learners. The collaborative inquiry process with a focus on student engagement yielded positive effects on student learning.

### 5. What are the enablers and challenges to developing collaborative inquiry teams in education?

There were various enablers and challenges to the CITE model used for collaborative inquiry. The enablers included having resources such as the school principal, SWS teacher, the Literacy/Numeracy resource teacher, and faculty facilitators in the group. On participant noted, "Teachers were supported in their understanding of student learning...in developing a problem. Facilitators helped teachers focus their questions and their strategies". Other enabling conditions were the supply teacher coverage provided and the school-based site location. A teacher stated: "Being able to discuss strategies and next steps for our students in a collaborative setting is helpful." Participants seemed to enjoy the SURE videos as a catalyst for discussion and greatly appreciated the Research Action Plan templates to guide the collaborative inquiry process with ample time for discussion. A participant reported: "We learned how to utilize the skills and strategies developed through the Research Action Plan Cycle and effectively apply this process to our individual classroom focused goals." The use of the D2L site was useful, for most participants: "Finding out about D2L allowed me to think broader and how my classroom research could impact other classrooms within my school and across the Board. D2L allows teachers to share their reflective practices to a wider audience. The potential is limitless."

The challenges reported by participants include the short period of five months (some would have liked a year-long initiative): "Time...not enough time to gather data and share ideas," and "Would have been great to have a 10-month initiative...to gather more data." The need to "let go" of preconceived notions regarding student learning processes and teacher control was articulated as a challenge by one participant: "Overcoming some of my own challenges when identifying and implementing specific strategies to students, i.e.: letting go of some control." Some participants also expressed a desire to learn more about the potential usages of the D2L learning management system for the collaborative inquiry process: "A challenge is finding out more about D2L." This tool was both an enabler and a challenge as not all participants were comfortable with using D2L. Another challenge expressed was that a baseline was not available in some cases to specifically discern changes in student learning or task completion: "Need more depth and base...and that will come."

Participants identified release time, school board personnel support, structure of CITE sessions and professional facilitation as enablers. Challenges included the limited opportunity for total immersion in the collaborative inquiry process over a five-month period and lack of familiarity with D2L. As expected, more time and better use of the learning management system were noted as potential conditions to further enable the collaborative inquiry and research.

## Discussion

The present collaborative inquiry initiative is an innovative educational research community model because it has demonstrated positive effects for both the participants and the students in their school, utilizing human resources and the technological support of a learning management system. Similarly to Martinovic et al. (2012), the present study affirmed that focused attention, support from researchers and administrators, and structured activities foster teacher research acumen and are appreciated by teachers. The study also showed that collaborative inquiry school-based teams can become a catalyst for educational research, KMb, and student learning (Edelstein, 2015). The following table summarizes the two main themes that emerged from the findings of the present study are *Teachers as Engaged Researchers* and *Students as Engaged Learners* (Table 1)

Table 1

*Teachers as Engaged Researchers* and *Students as Engaged Learners*

| Theme | Subtheme |
|---|---|
| Teachers as Engaged Researchers | Professional Growth and Resources |
|  | School Culture of Inquiry |
|  | Enablers for Collaborative Inquiry |
| Students as Engaged Learners | Teacher Pedagogical Practices |
|  | Classroom Culture of Inquiry |
|  | Enablers for Student Learning |

The first main theme "Teachers as Engaged Researchers" included the subthemes of professional growth and resources, school culture of inquiry, and enablers for collaborative inquiry. The concept of "teachers as engaged researchers" was evident throughout the participants' comments affirming their professional growth through the CITE initiative. Participants were initially wondering about the focus of the study, but quickly embraced the excitement of documenting their own learning and that of their students. The school culture became one of inquiry, questioning, and reflection as noted in the study by Kyei-Blankson (2014). As was found by Cooper (2011), the KMb efforts that included teachers and researchers in the same sessions created a culture of inquiry, not only in the CITE initiative but also throughout participants'

67

classrooms and the school. An interesting finding was that the use of the D2L learning management system site was deemed as both an enabler and a challenge. It was useful to have all the materials posted on one site and to have a forum for discussion, but using this strategy without training presented challenges. Perhaps the use of an online platform for collaborative inquiry, as also suggested by Cooper (2014), is an area for future study. Other enabling conditions were the professional nature of the sessions, with the provision of agendas, minutes, presentations, and templates for structured activities. There was also ample time for discussion and questioning in a stimulating setting with collegial support. The SURE videos, addressing a variety of topics related to educational research, were of interest to the participants, especially because the videos included familiar school board staff and local schools. The videos stimulated discussion and affirmed participants' perspectives on the importance of collaborative inquiry in the process of building common understandings across educational settings. The trust and empathy that is needed for a successful collaborative inquiry were formed through the communication, commitment, and continuity of the research team (Ponte, et al., 2004). The fact that the university faculty members had previously been members of the school board may have nurtured a sense of trust in the group and facilitated the mobilization of knowledge from theory to practice.

The second theme, "Students as Engaged Learners," emerged as CITE participants became more aware of pedagogical issues in their learning environment and learned how to seek solutions for student challenges. The participants increased their familiarity with the research process and collaborative inquiry teams. Focusing on the development of teacher as researcher identities and questions of inquiry related to student engagement and learning, participants created a culture of inquiry in their classrooms. Teachers reported that students wanted to know more about their teachers' research and the teachers strived to complete exemplary work since it was being examined as pedagogical documentation. Students became excited about the research and the teachers' use of such strategies as writing guidelines, timed tasks, and meditation to promote persistence, resilience, task completion, and community building. The teacher participants reported that students were able to sustain greater attention to tasks and were more independent and resourceful during their self-directed work periods. The results of the present collaborative inquiry were encouraging, and there is the possibility that students might also become researchers in exploring their areas or questions of inquiry.

The findings of this study showed that the CITE model of collaborative inquiry—a research partnership between teachers, school board administrators, and university faculty facilitators—is an effective vehicle for addressing school improvement plans and increased student learning. Such collaborative inquiry promotes knowledge creation and mobilization, ultimately enhancing student engagement and learning.

The following three simple formulas reflect the main themes identified:

| | | | | | |
|---|---|---|---|---|---|
| **Teachers** | **+** | **Collaborative Inquiry** | **=** | **Teacher Researchers** |
| **Teacher Researchers** | **+** | **Knowledge Mobilization** | **=** | **Student Engagement** |
| **Student Engagement** | **+** | **Evidence-based Strategies** | **=** | **Student Learning** |

There are various factors in the CITE initiative that could be considered as limitations to this study. The participants volunteered to be involved in this collaborative inquiry, which may have contributed to the positive attitudes towards research. Additionally, the presence of the principal may have been deemed to keep teachers engaged in the process and affect the outcome of the

collaborative inquiry as teachers may have verbally stated what they may have perceived the principal would find appropriate (written comments were confidential). It is well documented that principals play a pivotal role in school based collaborative inquiry processes (Fullan & Langworthy, 2014). It would be interesting to replicate this study with teachers and principals of differing schools and over a longer period to allow for the inquiry cycle to be completed over one school year.

## Conclusion

From the present study, it is evident that there are many positive results and outcomes to the collaborative inquiry initiative, formed in a partnership between a school board and university faculty members. The positive effects include teachers' increased familiarity with research and pedagogical practices to enhance student engagement in learning. It can be deduced that the collaborative inquiry process was also an excellent vehicle to utilize KMb resources such as the SURE videos to address the challenges to teachers' utilisation of educational research as outlined by Martinovic et al. (2012). The use of videos, structured sessions, faculty and technological support, and a school improvement focus created the compelling purpose of CITE and ensured its sustainability over five months and into the future. Participants expressed ongoing appreciation for the learning experience stating that "it brought to life the school improvement plan" and created a "culture of responsive teaching." The CITE sessions were facilitated through a board budget, in collaboration with the SWS teacher and the school principal. Perhaps, with limited resources, these sessions could be supported by *planning time* periods renamed as *research time* periods, with focused usage of at least one monthly period of this research time devoted to a collaborative inquiry initiative. It was affirming to note that participants embraced the opportunity to learn from the SURE videos, complete the components of the Research Action Plan, experiment with the D2L learning management platform, present their preliminary findings at a related conference, and embark on a writing project. Collectively and collaboratively, this CITE initiative named, framed, and proclaimed authentic and applied educational research, utilizing KMb strategies and resulting in enhanced teacher and student engagement and learning.

## Acknowledgements

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# Collaborative Teacher Inquiry Into iPad Use in Grade 3 Classrooms: Mobilizing Knowledge Through a Long-term School-University Partnership

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## Abstract

*In this paper, we report on a longitudinal case study exploring Grade 3 teachers' implementation of iPads in the Language Arts classroom. A school-university partnership was formed based on a collaborative teacher inquiry model. We examined factors that shaped our collaboration. The project resulted in greater teacher sharing of iPad implementation strategies and growth in leadership skills among the teachers. A surprising finding was the degree of reciprocal learning about digital pedagogy that the university researchers experienced during the study and were able to share with their Pre-service Education classes. We emphasize the potential of school-university partnerships for narrowing the current gap between theory and practice in technology-enhanced learning.*

*Keywords: school-university partnership, collaborative teacher inquiry, knowledge mobilization, technology integration, iPads in education, school-based professional development*

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## Introduction

Digital technology has the potential to reform classrooms in ways that were seldom considered before the beginning of the 21st century. The fundamental role of teachers in technology-enabled classrooms is transformed from that of gatekeepers of knowledge to resource managers and design consultants (Knoble & Wilbur, 2009). Digital devices such as iPads allow students to interact with multimodal texts, collaborate with peers on a local and global scale, and choose multiple ways to demonstrate their learning. Governments and school boards in Canada and the United States have made substantial investments in technology (Herold, 2015; People for Education, 2014). Technology implementation, however, has lagged in many schools and established teaching practices have not been challenged or transformed (Ertmer & Ottenbreit-Leftwich, 2010; Herold, 2015). The gap between the potential of technology and its effective use in educational settings is an issue that needs to be addressed for students of all ages.

### Collaborative Teacher Inquiry

Recent studies recommended that professional development in technology be school-based and adapted to the needs of the teachers and students in the school (Ertmer & Ottenbreit-Leftwich, 2013; Fisher & Rosenthal Tolisano, 2014). Hughes (2005) identifies collaborative teacher inquiry as an approach to professional learning that holds strong potential for technology integration. Teachers can focus on shared problems of practice (Palmisano, 2013) in a collegial setting where they can own the initiative instead of being confined by system-driven, top-down mandates (Cody, 2013). Credibility increases when individual teachers report on their classroom experiences with technology (Hobson, 2001) and an atmosphere of trust is established through which risk and uncertainty are valued and supported (Snow-Gerono, 2005). Collaborative teacher inquiry projects may also involve collaboration with academic researchers. The initiative may begin with the university, the board, or through joint needs and goals (School Board–University Research Exchange, 2014).

### School-University Partnerships

Partnerships between school boards and universities have potential benefits for both groups. Working on their own without such partnerships, academic researchers may develop ideas solely from their research data while practitioners may draw conclusions exclusively from their interactions with students (Christianakis, 2010). By working together, academics and teachers can contribute their unique knowledge, skills, and perspectives to the inquiry.

Historically, school-university partnerships have been characterized by unequal power dynamics (Christianakis, 2010). University academics traditionally have created theories that practitioners (i.e., teachers) have implemented. This power differential has often led teachers to complain that theory is not relevant to practice. Randi and Corno (2007) agree that this perception may be valid "if teachers are handed particular theory-based practices, one-by-one, and asked to apply them, no matter what their teaching situations" (p. 341). True school-university partnerships require that all participants

75

assume a "learning stance" (Literacy/Numeracy Secretariat, Ontario Ministry of Education, 2011), meaning that outside researchers or colleagues must visit a teacher's classroom as fellow learners rather than make judgments based on an external set of standards.

Trust in a collaborative relationship may need to build over time. Dana et al.'s (2001) report on professional development schools—involving a learning community of school and university personnel—showed that trust was a persistent problem in the early years; teachers were concerned that university professors "would not appreciate the work they do nor understand the complexities of their jobs "(p. 19). An atmosphere of "safety, trust, and care" (Clark, 2001) was established over time when teachers became equal partners in the research process and everyone was identified as a co-learner. Ertmer and Hruskocy (1999) described a multi-year school-university partnership designed to support technology integration in an elementary school. Trust was built by treating all team members as partners in the project, regardless of their role or rank. Teachers worked with university researchers to plan and implement all aspects of the project. Monthly meetings to identify changing needs and revise implementation strategies helped to keep lines of communication open. The study found an increase in teachers' levels of instructional and professional uses of technology, and a growth in students' confidence, self-esteem, and computer skills.

## Background to Project

In the fall of 2013, two Grade 3 classroom teachers in an Ontario school board met with a former colleague and a university researcher from a nearby Faculty of Education to discuss the possibilities of a collaborative inquiry into iPad implementation in their Grade 3 classrooms. The former colleague and now retired teacher, Deborah (all names are pseudonyms), had connections with both the teachers, Candace and Natalie, and with Rita, the university researcher. Deborah had been a teaching partner with Candace and Natalie some years ago and, at the time of the meeting, was a participant in a technology-related research project with Rita. Candace and Natalie taught in the same school board, but in two different schools, and two different cities in the board. They initiated the contact because they were intrigued by Deborah's positive experiences with the technology-related research project mentioned above.

It was agreed that, once necessary permissions and ethical approvals were obtained, Rita and Deborah would visit the classrooms of Candace and Natalie at least once a month to provide feedback on their instructional use of iPads, primarily in language arts instruction. Rita and Deborah met with school board curriculum and research personnel to discuss the project and to ensure that the goals were consistent with the board's 21st century student outcomes. The board approved the project and classroom visits commenced in mid-November 2013. After each year of the collaborative inquiry, Rita submitted an ethics protocol to both the university and the school board as well as a brief report to the research officer in the board regarding the previous year's work. New parental permission forms were collected each September.

In the spring of 2015, Natalie was seconded to an administrative position and left the classroom setting and the study. That fall, Candace's teaching partner, Jessica, asked to join the project, and Rita and Deborah continued to work in both classrooms when

visiting the school. The project is currently in its third year, with Candace and Jessica as active participants. Over the course of the collaborative inquiry, a total of 31 visits have been made to the classrooms of Candace, Jessica, and Natalie, as well as five evening meetings held in Deborah's home to discuss the progress of the inquiry.

The initial project goals focused on developing a pedagogy for using iPads in language arts and were somewhat general in nature. We were aware, however, that detailed goals are not always articulated at the beginning of a collaborative teacher inquiry; teachers "remain flexible and open to learning who their students are and how best to teach them" (Cody, 2013, p. 68). As the inquiry progressed, Natalie and Candace (along with Jessica during Year 2 of the study) began to narrow their research focus. Natalie was committed to examining how she could set up a classroom that would allow students to display self-regulation (Mitra, 2010; Shanker, 2013) in their use of iPads. Candace and Jessica looked for evidence that the use of iPads went beyond engaging student interest and led students to delve more deeply into their learning. Rita shared her goals of identifying aspects of the school-university partnership that were helpful to the collaborative inquiry and those aspects that detracted from its effectiveness. She was also interested in learning about effective pedagogy for integrating iPads so that she could share these insights with her pre-service teacher education classes.

The research questions that evolved since 2013 were as follows:

1. What kind of classroom environment does promote student self-regulation in the use of iPads?
2. How does the use of iPads in the classroom influence student engagement and learning?
3. What factors and interactions in a school-university partnership facilitate effective collaborative teacher inquiry?

Although data were collected and analyzed for all three questions, it is the last research question that we address in this paper. The first two questions will be the focus of subsequent papers.

**Theoretical Framework**

Early in the study, Candace expressed her frustrations with attending typical workshops for teachers on the use of iPads: "So often we are just given a list of apps and told to 'make a pic collage' instead of being shown how to use it in the context of a lesson" (meeting notes, November 2013). Candace was identifying a paradigm for learning in which so-called "experts" provide information to passive students (in this case teachers during off-site professional development workshops), without helping them to transfer the new learning into their respective settings. In contrast, this study is based on the theoretical framework of *situated learning* (Lave & Wenger, 1991), which views the learner as part of a social group that shares common goals and knowledge. Such groups are usually referred to as *communities of practice* (Lave & Wenger, 1991). Knowledge is co-constructed through shared stories and joint problem-solving in authentic contexts (Hoadley, 2012). In a community of practice context, teachers would not be faced with the task of applying a

list of iPad apps they saw demonstrated in a workshop, but would work with workshop facilitators and colleagues to discover and apply iPad pedagogy in their classrooms.

Collaborative teacher inquiry groups are examples of communities of practice, as the goals of learning are determined by the members who engage in ongoing knowledge building. Palmisano (2013) highlights the contrasts between collaborative teacher inquiry and traditional professional development approaches:

> Moving from professional learning approached as the acquisition of methods and structures developed outside the classroom and the school, collaborative inquiry places educators in the role of actively constructing professional knowledge through treating their classrooms and schools as sites for investigation (Literacy in Learning Exchange, 2012).

Other knowledge-building communities, such as universities, can become part of the teacher community of practice, with each member contributing unique perspectives and backgrounds. Hoadley and Kilner (2005) explored the potential for technology to enhance communities of practice by enabling communication and shared knowledge among participants. Wenger, White, and Smith (2009) stressed that a community should not beDdefined by the particular technical domain in which it meets (e.g., a chat room or a blogging site), but should "find an identity that is defined by its learning rather than a specific tool" (p.189). In the current study, e-mail became an important tool for sharing insights and resources among participants when the researchers were not in the school setting. Nevertheless, our learning benefitted most from the interplay of classroom visits, e-mail exchanges, conferences, and off-site meetings. Our school-university community of practice was enriched by the participants diverse perspectives and the combination of technology-enhanced (e.g., e-mail) and face-to-face interactions.

## Methodology

We chose a qualitative case study method to report on this collaborative school-university inquiry project. Merriam (1998) identifies three characteristics as fundamental to a qualitative case study: (a) it is particularistic, meaning that it focuses on a "particular situation, event, program, or phenomenon" (p.29); (b) it is descriptive because the product is a "rich, 'thick' description of the phenomenon under study" (p.29); and (c) it is heuristic in its illumination of the reader's understanding of the phenomenon.

### Participants

Candace, Natalie, and Jessica are experienced classroom teachers who initiated contact with Rita through their former colleague Deborah. Candace and Natalie have been teaching in the same board for 20 years and Jessica for 12. Deborah is a retired teacher who had previously served as an informal mentor to Candace and Natalie. She is now a sessional instructor at the same Faculty of Education where Rita has been employed as a professor for 24 years. Rita's teaching responsibilities at the university focus on language arts instruction for pre-service students in the elementary panel. Before joining the

78

University, she was a teacher, a department head, and a curriculum consultant with a nearby school board.

When visiting classrooms, both Rita and her research assistant Deborah assumed the participant observer (Cresswell, 2008) role. Although they often sat at a table and made observational field notes, they also circulated around the classroom, interacting with students and frequently engaging in ongoing feedback with the classroom teacher. Rita and Deborah served as "critical friends" (Bambino, 2002; Costa & Kallick, 1993) by giving verbal feedback both during class activities and in short meetings over lunch or recess. On more than one occasion, Deborah and Rita were invited to teach part of a lesson, and both researchers often joined in whole group discussions or worked with small groups of students.

**Data Collection Procedures**

Multiple forms of data were collected over the course of the project. Some of the data sources focused on the implementation of iPads in the classrooms. Rita and Deborah took observational field notes during each class. The notes described the teachers' pedagogical decisions, the students' reactions in a large group setting, and the students' performance during application tasks. As they interacted with students, Rita and Deborah often asked questions about the choices students were making in their assignments and their preferences for various iPad apps. They also took photos and videos of student work samples, as well as charts and other instructional materials prepared by Candace, Natalie, and Jessica.

Data related to the nature and effectiveness of the school-university partnership were also collected. Rita and Deborah made observational notes about the participants' interactions during in-class visitations, in-school planning sessions, and more informal evening meetings. E-mail correspondence was also used as a data source.

A questionnaire at the end of Year 1 asked Candace and Natalie to respond to questions about both iPad implementation and the nature of the school-university partnership in the collaborative inquiry. Questions related to the latter (the focus of this study) were as follows:

1. How helpful was it to be part of a collaborative inquiry group? In what ways have you grown professionally through this experience?
2. What personal goals do you have for technology-enhanced instruction in the next year of the project?
3. How could the collaborative inquiry team (Deborah, Rita, and fellow teachers in the project) help you meet these goals?

In Years 1 and 2 of the project Candace, Natalie, and Jessica made presentations at a variety of conferences, and their PowerPoint slides were collected as a data source.

**Data Analysis**

The data analysis was an inductive process (Cresswell, 2008) that began with a preliminary exploratory analysis of the multiple data sources, including observational

79

field notes taken by both Rita and Deborah, e-mail exchanges among the participants, PowerPoint slides of conference presentations, Year 1 questionnaires, and student work samples. Following repeated readings of materials, data segments were coded as they related to both the pedagogy of iPad use by Natalie, Jessica, and Candace and to the dynamics of the school-university partnership. In this paper, we explored only the themes relevant to the research question: "What factors and interactions in a school-university partnership facilitate effective collaborative teacher inquiry?" Rita performed the data analysis, followed by a member check of themes and interpretations by Deborah, Jessica, Natalie, and Candace. The research officer in the school board also received a draft and was invited to offer comments. Internal validation was further strengthened by a long-term observation at the research site (2 years of observation at the time of writing) and triangulation of multiple data sources (Merriam, 1998).

## Findings and Reflections

Candace and Jessica delivered a poster presentation at a major conference on technology in education. The title of their conference poster was "Practical Ideas for Integrating iPads Into a Grade 3 Classroom." They had expected just a few teachers to drop by their table, but discovered they had been allocated a prime location in the conference hall with room for numerous rows of chairs. Their PowerPoint slides, which had been designed as talking points for brief one-on-one conversations, became the basis for an instant workshop presentation to over 40 conference delegates. After the presentation, Candace sent the following e-mail to Rita, Deborah, and Jessica:

> You should have seen our faces when we saw the booth they put us in! We had to adjust our presentation right before it started because all these people showed up and parked themselves on the furniture–they were there for the long haul, so we went slide by slide and did a formal presentation. We had a few come up and talk to us after and it sounded like they liked it and found it helpful. (e-mail correspondence, May 7, 2015.)

Candace's e-mail reflects three of the themes derived from multiple data sources: building trust, breaking down silos, and teachers as leaders. Another theme that emerged from the data was reciprocity of learning, often present in Rita's and Deborah's stories of teaching pre-service Education classes.

**Building Trust**

It was not easy for Candace, Natalie, and Jessica to describe their use of iPads to conference participants in a setting quite different from their classrooms. When Rita first suggested they had valuable insights to share more widely, their reaction was tentative. Rita invited them in the first year of the project to present at a Technology Showcase for local teachers and pre-service students at the University. Candace's response was: "I will talk about it more with Natalie. I could maybe be persuaded…" (e-mail correspondence, November 11, 2013). As the conference approached, Candace wrote: "Natalie and I are in full panic mode… I sure hope we do OK – I am getting really nervous about it" (e-mail

80

correspondence, May 7, 2014). How did they move from this state of insecurity to one in which they trusted their practice and were comfortable sharing their findings in a large venue?

Several factors contributed to the development of trust between the school and university partners. On one hand, our school-university community of practice had the advantage of building on pre-existing positive relationships among Natalie, Candace, and Deborah. When Jessica joined the study, she was already Candace's colleague and teaching partner. On the other hand, Rita was unknown to the classroom teachers, apart from her published work in language arts. Candace admitted early that she was intimidated by the fact that resources authored by Rita were in her classroom and hoped that Rita would not judge her for failing to use academic jargon in her conversations. Candace described herself as "just a teacher." Natalie seemed more comfortable with Rita's occasional use of academic terms, as she had worked for a time as an itinerant resource teacher, read widely on educational issues, and had some experience presenting to colleagues in her school board. Deborah's presence was extremely valuable because she had previously collaborated with Rita on a research project and could report her positive experience to the teachers. The preliminary meeting Deborah hosted in her home also helped everyone to relax.

During the many classroom visits, the feedback given by Deborah and Rita was constructive and specific. Acting as critical friends, they were able to point out dynamics that may not have been apparent to Natalie, Jessica, and Candace in the busyness of their classrooms. On occasion, it was necessary to point out the positive aspects of a lesson that the teacher had thought was unsuccessful. After one such lesson, Deborah responded in an e-mail to Candace:

> Don't be so hard on yourself. It was great! I learned so much talking to the kids about what they learned; a few prompts and they were able to tell me what they were doing. They loved the activity, and they really are so curious about their learning. Your natural talent as a teacher shines through (e-mail correspondence, June 11, 2014).

These affirmations are important in building a collaborative community. Snow-Gerono (2005) emphasized the importance of a support network when teachers examine their pedagogy: "Questioning personal practice can be a difficult and uncomfortable position for teachers. However, when people are supported and assisted with their questions, inquiry becomes a collaborative, more attainable experience" (p. 247).

The gulf between the traditional university orientation to theory and the school emphasis on practice dissipated during our collaborative inquiry, which not only built trust among the members of the group, but also helped Natalie, Jessica, and Candace to appreciate their teaching. On numerous occasions, Rita and Deborah pointed out the skillful use of instructional strategies that facilitated differentiated instruction in technology, or that supported the "Gradual Release of Responsibility" model (Pearson & Gallagher, 1983) underlying their lesson planning. Although these strategies were simply part of the instructional repertoire of these experienced teachers, the teachers seemed pleased to have their skills acknowledged.

Rita and Deborah frequently followed up on visits with e-mails that recommended practical resources, websites, and blog posts that either addressed a concern or might enrich the lesson they had seen. Rita shared a list of iPad apps for teaching poetry and Candace replied: "Love, love, love this site!!! I just said to Jessica the other day that I feel we are on a plateau, and we need some new ideas to try" (e-mail correspondence, April 9, 2015). Jessica added: "I may actually enjoy working with poetry using these! Thanks for thinking of us!!!" (e-mail correspondence, April 9, 2015). In an e-mail message, Deborah also captured the trusting relationship that developed between the school and university partners by the end of the first year:

> This has been a wonderful experience, and we so appreciate that you trust us to be part of the reality of everyday teaching. It is a rare thing to have the rapport we have developed this year, eating, drinking, laughing, and sharing… Rita and I could never have learned what we did without your openness and honesty" (e-mail correspondence, June 11, 2014).

**Breaking Down Silos**

The systemic isolation of teachers from one another is often identified as a stumbling block to the integration of technology. Hobson (2001) describes the architecture of schools as "cellular patterns separating each one from the others" (p. 174). In addition to being physically divided by architecture, Hobson argues that teachers are also prevented to collaborate due to their distinct timetables, supervision duties, grades, and subject areas.

In Year 1 of the study, Natalie was new to her school and taught in a portable classroom. Opportunities for her to share her passion for technology with fellow teachers were limited. The visits from Deborah and Rita allowed her to have the "critical friends" she sought in the initial meeting of the group. Due to lack of supply teacher coverage Natalie was not able to visit Candace and Jessica's classrooms, but Rita and Deborah often shared what they had observed during the classroom visits. Evening meetings of the group provided rich conversations about what each teacher had tried recommended professional readings and apps, as well as insights into the intricacies of managing classroom dynamics when integrating technology.

Candace and Jessica benefitted from teaching next door to one another. They shared planning time and were able to move back and forth during a lesson to problem-solve and make suggestions. This ability to break out of the silo effect allowed them to learn on-the-go, and addressed one of Candace's reasons for joining the collaborative inquiry: "When you're on your own, you're not learning anything" (meeting notes, November 15, 2013).

The workshops and conference presentations Jessica, Natalie, and Candace, made over the first two years of the project helped them to escape from the silo effect as well. They received positive feedback on their work from fellow teachers and were able to attend other conference sessions on technology-enhanced instruction. In one particular case, Jessica and Candace returned from a teacher-led workshop on iPad use in mathematics and were thrilled by the practical strategies and resources they had acquired.

82

**Teachers as Leaders**

Over the course of the study, Natalie, Jessica, and Candace showed growing leadership on several fronts. Their willingness to share their successes and challenges with iPad implementation was welcomed by teachers and pre-service students at workshops and conferences. They presented at a Technology Showcase attended by teachers from surrounding school boards and pre-service teachers. They also were accepted as presenters at two major technology-in-education conferences for teachers, administrators, and technology companies. While Rita and Deborah provided input on proposals and PowerPoint slides, and attended the sessions as supportive observers, the experts were clearly Natalie, Candace, and Jessica. Curriculum leaders in their school board attended one of their conference sessions and subsequently invited them to share their findings with senior administrators in the school system. In addition to informing K-12 teaching, Natalie, Candace, and Jessica also enriched Rita's and Deborah's classes at the Faculty of Education. Rita and Deborah frequently used their observations from the research sites to highlight technology-enhanced learning in their pre-service courses. After the first year of the study Candace reflected:

> I have grown a lot from this experience. As an experienced teacher, you can get stuck in a rut and not try new things in the classroom. This year, I have come out of my comfort zone and really tried many new things within my classroom and outside of my classroom. I am not much of a public speaker, but having to talk to groups of teachers at the conference made me more comfortable to speak in front of others (e-mail correspondence, June 2014).

Natalie and Jessica continue to downplay the groundbreaking nature of their contributions to iPad pedagogy. When Rita shared with them the initial draft of this paper for validation of themes, Natalie declared: "You have made me look like I know what I'm doing" (e-mail correspondence, September 02, 2015). Jessica added: "You've captured our journey very well, and I think we're all better teacher learners because of these experiences we've shared" (e-mail correspondence, August 316, 2015).

**Reciprocity of Learning**

When Deborah approached Rita in 2013 indicating that Natalie and Candace were interested in working with her, Rita was open to the idea. She had a particular interest in linking theory with practice and was keen to see how technology was being implemented in elementary classrooms. At the initial meeting, everyone shared their hopes for the project. Rita's hope was simple: "I want to see good teachers using technology" (meeting notes, November 6, 2013). She also hoped that her preliminary investigations into apps for literacy learning would be useful to Candace and Natalie. What Rita did not anticipate was that her teaching practice at the Faculty of Education would be enriched by this collaborative inquiry. Moreover, many of her students reported using the shared resources and strategies in their teaching placements.

83

As Rita observed Natalie, Candace, and Jessica using iPads in Language Arts instruction, she began to see links between theory and practice with respect to technology-enhanced learning. She applied frameworks such as the "Substitution Augmentation Modification Redefinition Model" (Puentedura, 2013; Schrock, 2015) to explore how the teachers in the study used technology in their lessons. Did teachers' use of digital applications enhance student learning through substitution or augmentation of traditional practice, or did they transform learning through uses that could be classified as modification or redefinition of previous modes of learning? Rita also examined the professional growth of Candace, Jessica, and Natalie through the lens of "Technological Pedagogical and Content Knowledge," a framework that explores the interplay of technological, pedagogical, and content knowledge in teacher professional learning related to technology (Mishra & Koehler, 2006). As an academic, she realized how valuable it was to have a research site in which emerging theory could be linked with practice.

Beyond connecting theory and practice as it relates to technology, Rita was also able to incorporate many general pedagogical concepts regarding literacy into her classes at the Faculty of Education. By using specific examples from visits to her research sites (while respecting all ethical protocols regarding anonymity), she was able to illustrate abstract concepts for her students. For example, when discussing how to organize a Literacy Block that included various instructional formats, Rita described Natalie's procedure for using a combination of learning centres, guided reading, independent reading, and online resources. Slides of Natalie's classroom—— taken before class began and without students—showed how the arrangement provided for collaboration in small groups, teacher-student conferences, independent work, and whole class discussions. Rita was able to explain the "Gradual Release of Responsibility Model" (Pearson & Gallagher, 1983) by describing how Candace and Jessica introduced a new iPad app to their classes by moving from teacher modeling, to shared creations by the whole class, to individual or paired work. An example of differentiated instruction presented itself when a child who struggled with writing nevertheless conveyed emotions in a poster about social justice through the use of "emojis" (often used in texting and e-mails to convey emotions) rather than traditional text. When Rita's students were learning how to write lesson plans, Rita modeled a lesson she had seen that week in Candace's class, and systematically deconstructed it using the template for a lesson plan. In each of these instances, Rita's lectures became relevant and current because of her observations and participation in K-12 classrooms.

Rita's students also benefited from digital resources she encountered in the schools. One that her students loved was the web-based application "Kahoot" (Kahoot.com). This tool allows a teacher to create online quizzes that use background music, timed responses, and team play to create tension and excitement. Rita had been amazed by the engagement of Grade 3 students in Jessica's and Candace's classes when they played Kahoot to review the usually dry topic of non-fiction text features. Rita recounted this experience to her own classes, then had them participate in a Kahoot quiz about literacy terms. Rita's students, too, reacted with tremendous enthusiasm. Many students reported using this tool successfully in their subsequent teaching practicum.

One iPad app, in particular, led to a series of exchanges between Rita and Candace. Rita observed Candace using the app "Pic Collage" in her class as a way for

84

students to represent what they had learned about the Native American leader Chief Joseph. Pic Collage provides for the creation of photo collages accompanied by text and sound. Rita described this lesson to her Language Arts classes and had her students use *the app* to illustrate haiku poems they had written based on Col. Chris Hadfield's tweets sent from the International Space Station. Each tweet described a location on Earth he observed from space. When Rita recounted this lesson to Candace, she taught her Grade 3 students the haiku poetic form, creating haikus and Pic Collages to synthesize what they had learned about Chief Joseph. Rita sent the following comment to Candace: "You and I need to write about this incredible back and forth learning from such diverse age groups" (e-mail correspondence, March 5, 2014).

Finally, this collaborative inquiry project became a model for Rita's students as they embarked upon a collaborative inquiry of their own for a major course assignment. Rita shared the following with Natalie, Jessica, and Candace:

> When we get together, I will tell you how I used our project with my classes this week to explain collaborative inquiry and problems of practice. They are identifying areas of Language Arts to investigate further based on their first placement experiences. I think it was helpful for them to hear that experienced teachers are never satisfied with their practice and still find areas in which they see the need to learn more (e-mail correspondence, January 9, 2014).

Whether it was theories of technology-enhanced instruction, general pedagogical concepts, specific iPad or web-based resources, or the nature of communities of practice, Rita and her students benefitted greatly from her participation in this project.

## Discussion

The gap between theory and implementation of technology-enabled instructional practices is a serious concern for educators. In this study we explored the potential for a school-university partnership to mobilize and build knowledge related to iPad implementation in Grade 3 classrooms. Based on the principles of situated learning, we established a school-university community of practice in the form of a collaborative teacher inquiry to address this issue. Consistent with other communities of practice, we engaged in joint goal setting and problem-solving. Our growing knowledge of effective iPad pedagogy was co-constructed in an authentic setting over time.

We paid careful attention to building trust between the teachers in the study and the university researchers by positioning each person as a learner. Over a period of two years (and as we continue), the three teachers (Jessica, Candace, and Natalie) and the university researchers (Rita, and Deborah) experimented with approaches to using digital technology in the classroom, reflected on lessons, and shared resources. As a result of these interactions, Candace, Jessica, and Natalie grew as leaders in the area of iPad implementation while Rita's and Deborah's pre-service students benefited from the resources and pedagogical approaches their instructors brought back to their classes. In the traditional model of school-university partnerships, the assumption is that the university researchers possess knowledge that is imparted to the school participants

(Christianakis, 2010). In this paper, we showed that schools can provide rich insights to universities and influence generations of future teachers.

Even though this school-university community of practice was characterized by eager learners and a multi-year time frame, it was not without challenges. The silo effect was only partially overcome. Candace and Jessica in the second year of the project were fortunate to be positioned next door to one another and had a daily common planning time. As a result, they were able to collaborate on lesson planning and drop in on one another's classes to share insights and solve problems. Natalie, however, was in a portable in a different school, and there was no money for supply coverage for her to visit the classrooms of Candace or Jessica. In both schools, teachers in the study had limited opportunity to share their growing expertise with immediate colleagues. Much of their impact on other teachers came through conference and workshop presentations to those in attendance. It was also challenging to link this study with other technology initiatives in the school board, although Natalie and Candace were able to share their findings with administrators and participants in other technology-related studies on a few occasions.

The second area of concern was logistical in nature. While Deborah and Rita acted as "critical friends" in the classroom and gave feedback to Jessica, Natalie, and Candace during the lessons and through follow-up e-mails, they often wished they could meet with the teachers soon after each lesson to engage in more in-depth discussions and to plan for future lessons. However, the teachers often had supervision duties following the observation time and were not able to engage in immediate in-depth discussions.

The following recommendations are geared toward building school-university partnerships to foster the implementation of digital technology:

1. School-university partnerships should be based on the premise that all participants are learners. Power imbalances can be mitigated by ensuring that school participants are seen as fellow researchers and are involved in the design and implementation of the study.
2. University personnel should use their contacts and resources to build leadership skills among teachers in their study. Such capacity building will help to transfer the knowledge acquired to a wider audience of educators.
3. Administrators should assist teachers involved in a collaborative inquiry to meet regularly, whether through joint planning time, the positioning of classrooms, or secured funding to visit other sites.
4. Universities and school boards should collaborate so that school-based initiatives can be shared board-wide and resources provided to support teachers committed to professional growth.
5. Whenever possible, school-university partnerships should be maintained over time to facilitate the building of trust and to enable deeper engagement in long-term changes in practice.

**Moving Along**

As our collaborative teacher inquiry nears the end of its third year, we continue to evolve in our goals and procedures. Rita and Deborah are beginning to book regular feedback

86

meetings with Candace and Jessica during their planning time and immediately after each classroom visit. This allows for reflection on the lesson and future goal setting. Jessica and Candace are interested in expanding their iPad use to their social studies program and using an inquiry approach as the students explore social studies topics. They have been given release time to work with Rita and Deborah to plan this inquiry unit. Natalie returned to a classroom position mid-year, following her secondment as an administrator, and will return to the study in the fall. All three teachers have been involved with Deborah and Rita in writing papers about their iPad use, thereby sharing their insights more widely. The story continues.

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# BOOK REVIEW

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|---|---|
| **Title:** | **Knowledge Mobilization and Educational Research: Politics, Languages, and Responsibilities** |
| **Editors:** | **Tara Fenwick and Lesley Farrell** |
| **Publisher:** | **Routledge, London, and New York** |
| **Year of Publication:** | **2012** |
| **Reviewed by:** | **Ghazala Ahmed, Ph.D. Student, Brock University** |

In this book, Tara Fenwick and Lesley Farrell scrutinize the concept of knowledge mobilization by posing the following question: "Who determines what counts as impact, and for what purposes and what are the consequences of distinguishing users from producers in educational knowledge and research, and who benefits from such distinctions?" (p. 2). To answer this question, the editors focused on the following themes: considering the issues and the players, politics in knowledge flows, languages and enactments of knowledge mobilization, and responsibilities and rights in mobilizing knowledge. Fenwick and Farrell organized this book into four sections and 15 chapters to address the growing need for clarity around knowledge mobilization issues in educational research in Europe, United Kingdom, United States, Canada, Australia, China, and Russia.

      Part One, "Considering the Issues and the Players," is introduced by the authors Ben Levin and Amanda Cooper. According to the authors, knowledge mobilization means making stronger connections between research, policy, and practice. The authors reviewed the current situation around knowledge mobilization in education and discussed issues with regards to conducting empirical research in the field such as knowledge translation, knowledge management, research utilization, and knowledge transfer, as well as looked at the circumstances that can promote and enhance knowledge mobilization. Levin and Cooper conclude the chapter by pointing to several directions to improve knowledge mobilization work and research in education, such as the need to focus more on organizations and their practices rather than on individual researchers, policy makers, or practitioners. In Chapter 2, Andrew Pollard used the example of the *Teaching and Learning Research Programme* (TLRP) in the United Kingdom to illustrate a successful knowledge mobilization strategy. The TLRP program was established as a response to the governments' "crisis of confidence in educational research" (p. 31) and was situated within a specific U.K. political context. The main goal of the program was ensuring "evidence-based policy making" (p. 30) through "high levels of user engagement and impact" (p. 31). Andrew Pollard outlines six strategies that supported impact and user engagement in this project and illustrates short-term impacts such as contributions to teaching and learning policies and apprenticeship training for low-skilled youth. Anne Edwards, in Chapter 3, draws attention

to the possibilities for collaboration between university-based researchers and those practitioners who do research outside the academy to enhance practitioner engagement in research.

In Part Two, "Politics in Knowledge Flows," Charles Ungerleider uses his deputy ministry experiences in Canada as a backdrop to draw attention to the relationship between policy decision-makers and researchers. Ungerleider discusses the difficulties of incorporating research evidence into the political domain by using the Ben Levin story that explains the distance between the two worlds occupied by politicians and researchers. For example, according to Ungerleider, "the primary audience for the decisions made by politicians is the electorate—or, to be specific, the electorate upon which the politician depends for support" (p. 63). Ungerleider then compared politicians' work with the researchers' work by stating that "the primary audience for the work of researcher is other researchers in their field of study and secondarily the agencies that fund their research and the institutions that employ them" (p. 63). Ungerleider concludes the chapter by emphasizing the role of education practitioners and the conditions that favour a long-term relationship between research and practice, rather than the brief liaison between researchers and politicians.

Jenny Ozga, in Chapter 5, explores the relationship between knowledge and governance and illustrates how knowledge as data is used to govern education in England and Scotland. She argues that knowledge and information play an important role in the "pervasiveness of governance and in allowing the development of its dispersed, distributed and disaggregated form" (p. 73). Margaret Somerville, in the next chapter, explores how a series of art exhibitions was used to mobilize knowledge about Indigenous understandings of and relationships with water in the drylands of Murray-Darling Basin, in southeastern Australia. Using an emergent arts-based methodology—which she referred to as sitting "within a framework of Place and an Enabling place pedagogies approach" (p. 89)—the author narrates how art and storytelling created a knowledge flow between Indigenous knowledge and non-Indigenous knowledge about water conservation. In chapter 7, Phan Le Ha, criticizes the global domination of Western research-based knowledge, arguing that nation state and locality play an important role in knowledge mobilization. Phan Le Ha concludes the chapter by describing mobility as "a site of struggle and negotiation in itself when it comes to knowledge construction and identity making" (p. 111).

Section 3, "Languages and Enactments of Knowledge Mobilization," opens with Chapter 8, authored by Ian Dyck, who uses the example of a Canadian-Russian museum collaboration that produced an exhibition on ancient nomads of the Prairies and the Steppes of Russia to analyze the context and process of this type of knowledge mobilization project. The author describes in detail the strengths and the weaknesses of the project in regards to added cost, delays, and working difficulties such as insufficient funds and language barriers during the project development. He also discusses overcoming many restrictions and sensitive issues that emerged unexpectedly before launching the exhibition. For example, using Ancient Aboriginal burial materials was a sensitive issue to be considered for the Canadian exhibition and, therefore, a compromise was made to rely on a few replicas. In contrast, for Russian exhibitors, the ancient

burials were the major part of their exhibitions and they had no qualms about showing burials using real graves. Deidre M. Kelly and Michelle Stack, in Chapter 9, aim to find a way to bridge the gap in knowledge exchange, which they termed "double divide" (p. 128). The first divide, according to Kelly and Stack, refers to the "gap between academe and journalism in terms of how knowledge is represented and for whom" (p. 128), and the second divide "refers to the exclusion or marginalization of some areas of knowledge production and dissemination" (p. 128). The authors provide recommendations followed by strategies for academic researchers to collaborate with journalists and use media for effective knowledge mobilization. For example, one of the recommendations was to "assess the media based on communication goals" (p. 136) before choosing a venue for the scholarly work.

Tara Fenwick raises valid knowledge mobilization questions throughout the Chapter 10. For example, she poses the question of "what comprises research and what is most valuable in education research" (p. 142). Fenwick then tells the story of "what can happen, when researchers who describe themselves as non-artists attempt to work with art forms for purpose of knowledge mobilization" (p. 142). In Chapter 11, Chris Chesher and Sarah Howard discuss how universities cope with issues of knowledge mobility and knowledge management. The authors talk about tensions that emerge between "practices of openness and closure, democracy and authority, and intellectual autonomy and centralized management" (p. 154). Chesher and Howard also raise important questions about the value of existing knowledge practices at universities, such as: What happens to knowledge when the university is not the only provider of knowledge and how should the university locate itself in the market?

In the final section, "Responsibilities and Rights in Mobilizing Knowledge," Michael Fraser discusses global knowledge mobilization and its relationship to intellectual property and intellectual property law. In Chapter 13, Rui Yang looks at the publishing of journals in Chinese Mainland as a means of knowledge distribution within the global context. The author discusses certain issues concerning the use of Chinese indigenous publishers and journals, and suggests bringing indigenous journals to the forefront as a way to break the western monopoly on the publishing world. In Chapter 14, Dolores van der Way uses her teaching and research practice experiences in a Canadian university to propose the use of Indigenous pedagogy as a way to mobilize knowledge, especially in a classroom setting, in order to understand the history of colonization and the politics that govern the relationship between the Aboriginal communities and non-Aboriginal communities across the world. The book concludes with a chapter where authors Bob Lingard, Ian Hardy, and Stephen Heimans argue that "deparochialization and strong internationalization are required of educational research" (p. 214). The authors draw on Appadurai's (2001) and Connell's (2007) work to challenge the dominance of academic work produced in the Global North, and suggest the need for recognition of the perspectives and knowledge produced in diverse countries across the globe.

In summary, this book is an informative collection of works that originate from international contexts and provide valuable insights into the knowledge mobilization process within diverse educational settings. For example, Dyck's international collaboration provides a

working model for other modern-day museums to follow when developing similar knowledge mobilization exhibitions while Somerville illustrates the significance of art and storytelling as modes for mobilizing Indigenous knowledge. These chapters provide accounts grounded in empirical studies, real events, and existing organizations, pointing out the issues emerging from knowledge mobilization. The book is organized logically and caters to the growing demand for gaining a deeper understanding of knowledge mobilization in educational research, policy, and practice, especially when disseminating the new educational knowledge globally.

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