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Some Canadian contributions to understanding knowledge mobilisation

Amanda Cooper and Ben Levin

Knowledge mobilisation (KM) is our label for the emerging field of inquiry that seeks to strengthen connections between research, policy and practice across sectors, disciplines and countries. This paper first outlines the challenges associated with improving KM across public services. Next, it examines contributions from the health sector (findings and implications of empirical work on KM being conducted by two teams of Canadian scholars) in relation to the education sector and the broader field. Then, it outlines the Research Supporting Practice in Education (RSPE) programme (including products, events, networks and empirical studies), which attempts to increase KM in education. The paper concludes with some ideas and strategies that can be done quickly and easily to improve KM almost immediately in any organisation as well as with suggestions for further research.

Introduction

The gap between research, policy and practice is often lamented, both in education and in other fields (Davies et al, 2000; Pfeffer and Sutton, 2000, 2006; Lemieux-Charles and Champagne, 2004; Nutley et al, 2007). As indicated in every issue of this journal, the search for ways to strengthen these connections and improve the contribution of research to policy and practice is occurring across sectors, disciplines and countries (Levin, 2004; Boaz et al, 2008; Levin, 2008; Sin, 2008; Cooper et al, 2009). 'Knowledge mobilisation' (KM) is our label for the emerging field of inquiry that seeks to address this problem. A plethora of other terms exist, such as 'knowledge management' in business and 'knowledge translation' in health.[1] Regardless of the term, the underlying spirit of these movements in health, criminal justice, education and the private sector is the same – attempting to harness the benefits of research for organisational change and system improvement.

This paper is organised into four parts. It begins by briefly discussing KM issues occurring across sectors, emphasising the challenges of measuring research use and its impact, drawing attention to the need for more empirical research.

The second part of the paper examines the work of research teams led by two Canadian scholars who have made a substantial contribution in the past decade to what we know about research use – Rejean Landry at Laval University and John Lavis at McMaster University. Landry is an economist and political scientist now in a business school and holds a chair supported by the Canadian Institutes for Health Research (CIHR) and the Canadian Health Services Research Foundation

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(CHSRF). His research programme 'Knowledge transfer and innovation' focuses on how to encourage use of research by fostering strategic alliances between researchers and potential users to increase applied research capacity. Lavis works in a school of health sciences; his primary interest is knowledge transfer and exchange in public policy-making environments and the politics of healthcare systems. He holds a Canada Research Chair in knowledge transfer and exchange. Both teams have done important empirical work on how researchers communicate their work to various parties and on its take-up in various organisations.

The third section raises some of the important conceptual and methodological issues that arise from the work of Landry, Lavis and others, outlining new areas of work that have the potential to be productive avenues to pursue to further our understanding of KM in public systems.

The final part of the paper briefly introduces our Research Supporting Practice in Education programme (RSPE), which is attempting to understand and improve KM in education. Our programme of research and related activities is aimed at learning more about how to build strong linkages between research, policy and practice, and is supported with core funds from the Canada Research Chairs programme. Our work is intended to address some of the issues identified earlier in this paper.

Challenges in understanding research use

The study of research use and its impact is not new. Weiss' (1979) work on 'research utilisation' paved the way for KM. Many others have built on her work, naming it anew, 'research dissemination' (Knott and Wildavsky, 1980), 'implementation research' (Eccles et al, 2009) and so on. It is unnecessary to repeat yet again the litany of complaints around the inadequate use of research to inform policy and practice. (The whole issue of the relationship between 'policy' and 'practice' in relation to research use is one that itself requires more attention. In this paper we are concerned with research impact in both regards, because, while distinctions between 'policy' and 'practice' can be useful conceptually, individuals, organisations and studies are often involved in both.) Researchers and their institutions are criticised for insufficient attention to making their work known and useful, while policy makers and practitioners are criticised for their lack of attention to the available research. These points have been made over and over again in every field, with the assumption that better use of research could result in better outcomes (for an excellent review of the issues, see Nutley et al, 2007).

The many papers describing or complaining about the situation, however, are not yet matched by the required careful empirical work that would help us understand and, therefore, improve things. In our view, the literature that empirically examines research use and its impact across areas of social policy and practice is still insufficient (Lemieux-Charles and Champagne, 2004; Levin, 2004; Pfeffer and Sutton, 2006; Nutley et al, 2007).

On the other hand, Landry et al (2001) take a more optimistic view. While they acknowledge the bias towards theoretical and conceptual rather than empirical work in knowledge utilisation, they list a number of exemplary empirical studies that have been conducted (Huberman and Thurler, 1991; Lester, 1993; Unrau and McDonald,

1995; Oh and Rich, 1996; Oh, 1997). Landry et al (2001: 333–4) maintain that the perception of a dearth of research is exacerbated by the fact that 'empirical studies in knowledge utilisation are not very visible because they are scattered through the journals of many diverse disciplines'. Landry et al (2001: 334) also highlight that this 'dismal picture might also have arisen from a narrow definition of knowledge utilisation, which too often, associates utilisation only to instrumental use of knowledge in decision making or professional practice'. Although these are valid points, our view continues to be that this is an area in need of more empirical evidence.

The lack of evidence on research impact is in part because studying and measuring research use is difficult. Again, the conceptual challenges have been well described elsewhere (eg Nutley et al, 2007), so only need a brief mention here. There are multiple definitions as to what constitutes 'use', ranging from influencing people's thinking to influencing specific policy choices or practices. The approaches one might use to study these variations would need to be different. Use can occur over long periods of time and can manifest itself to different degrees and in different ways. Tracking the impact on policy or practice of various factors ex post facto, especially over long periods of time, is extraordinarily challenging since any field of policy and practice is subject to many competing influences. Even those involved may not fully appreciate all the factors that affect their work. Individuals are rarely explicitly aware of the internal processes by which they come to understand and make sense of the world around them (Weick, 1995). It is no surprise, then, to find that where empirical studies on research use do exist, they indicate that more work is needed to encourage uptake and increase its impact.

KM is also a challenging area of study because much of it occurs across sectors and would benefit from interdisciplinary efforts. Virtually all sectors, public and private, use research evidence to make decisions at least to some degree. Obviously, differences exist among sectors but there are also lessons to be learned because diverse sectors are facing similar problems (Davies et al, 2000; Pffefer and Sutton, 2000; Lemieux-Charles and Champagne, 2004). Similarly, KM issues are of interest to researchers in various disciplines, such as sociology, psychology and political science, and in a whole range of applied fields, which are themselves interdisciplinary. KM research is occurring in education, health, social welfare, criminal justice and the private sector (to name a few) by diverse types of scientists and in many different countries (Nutley et al, 2007). As is evident on the occasions when these diverse groups come together, such as at the annual meeting of the Campbell Collaboration, efforts often occur in isolation as different sectors, disciplines and countries fail to integrate, and build on each others' work. As a result, the proverbial wheel is continually reinvented as researchers conduct similar studies, or organisations in different fields try parallel strategies to the same effect, instead of learning from each others' failures and successes. This leads to the ironic conclusion that we have a failure to mobilise knowledge about knowledge mobilisation!

While concerns remain, the last decade or so has witnessed an explosion of interest in and work on issues of knowledge mobilisation. In the academic world, new journals have been created, new graduate programmes initiated and new conferences organised. Governments, facing populations that are increasingly well educated and increasingly

interested in evidence, have supported a range of initiatives to increase the use of evidence (Levin, 2008; Cooper et al, 2009). International organisations such as the Organisation for Economic Co-operation and Development (OECD) and the World Bank have paid growing attention to the impact of knowledge on policy and practice (OECD, 2007). And a whole range of new intermediary organisations, such as think tanks, lobby groups and private providers of knowledge, have entered the field. On all sides, new websites dedicated to sharing knowledge have proliferated with new tools and strategies to do so (for example wikis, blogs, live chatrooms). So, while much remains to be learned, there is a growing capacity to do the required work.

Canadian empirical contributions to understanding research use

Canadian researchers have made important contributions to our understanding of KM issues. In a recent review of research, Mitton et al (2007) found that more than half of the authors of high-quality studies related to what they call 'knowledge transfer and exchange' were located in Canada. In this section of the paper we discuss the contributions of teams led by two Canadian researchers – Rejean Landry and John Lavis. Both have made important contributions to research methods as well as to substantive knowledge about the transfer of knowledge by research 'producers' and the ways in which policy makers find and use research. In focusing on these two researchers, we do not wish in any way to minimise the contributions of other Canadian researchers, such as Grimshaw (eg Grimshaw et al, 2006) or Estabrooks (eg Estabrooks, 1999), who have also made significant contributions.

It is noteworthy that these contributions have been supported in large part by two Canadian research funding organisations with explicit interests in KM – the Canadian Institutes of Health Research (CIHR) and the Canadian Health Services Research Foundation (CHSRF). The work of these two organisations, not only in funding KM research but also in organising a wide range of KM activities, has been vital in the building of a critical mass of work on these topics in Canada. The Social Sciences and Humanities Research Council of Canada has also increased its emphasis on and support for KM-related work by researchers. The importance of supporting infrastructure is a point that does not always get sufficient attention in the KM literature.

We conceptualise the discussion according to three areas where KM work occurs: *research producers'* contexts, *research users'* contexts (here we consider policy makers and practitioners together due to our earlier point that many individuals and organisations span both policy and practice) and *third party agencies* that mediate between the two groups. We will start with the way that research producers share the knowledge and results of their work. Researchers, not surprisingly, tend to pay attention to their own work and interests, so there is more work on what is called 'producer push' (efforts made by researchers to communicate their work) than there is on how that work is taken up in practice.

Research use in Canada from researchers' perspectives

Landry et al (2001) adapted Knott and Wildavsky's (1980) seven standards of research utilisation, ranging from 'I transmitted my work' to 'my research led to applications' as the basis for a survey of more than 1,200 social science researchers across Canada. They found that nearly half of the researchers report some type of use of their work by practitioners, professionals and decision makers (here 'use' means at least the first stage of utilisation, which is the transmission stage). Of course, the perceptions of researchers may not be realistic, their knowledge about the use of their work can be quite limited, and so their opinions do not really tell us much about research impact, although they are revealing in terms of the degree of effort being made. Landry et al (2001) also suggest that levels of research use vary depending on domains and disciplines. Higher levels of research utilisation occur in professional social sciences, such as social work and industrial relations, compared with disciplinary social sciences such as economics or sociology. Perhaps one of the most important findings of this study is that 'knowledge utilisation, depends much more heavily on factors related to the behavior of the researchers and users' context than on the attributes of the research products' (Landry et al, 2001: 347). In other words, social features of the settings are more powerful than adapting and presenting the findings of the research in different ways.

In another study, this time related to the sciences and engineering, Belkhodja and Landry (2007) found that researchers with stronger publication records were actually more likely to do collaborative knowledge translation work, indicating that stronger researchers may do more dissemination rather than less. This study examined the 'triple-helix collaboration' of researchers, industries and government, and surveyed 1,554 researchers funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) in an attempt to explain why some researchers are more involved in collaborative projects than others. The results indicated that:

> The likelihood of researchers to collaborate with industry and the government increases as the researcher's productivity increases, and he is more focused on the users' needs, as he sets up a strategic network with industry and government partners, and as he is more implicated in drawing up a personal follow-up with users (dissemination efforts). The likelihood of researchers to collaborate will also tend to increase when the research budget increases, when the users' contributions increase, when the budget allocated to transfer activities to others than researchers increases and when the research activities conducted by the researcher in the past were more successful. However, the likelihood to collaborate will decrease as the researcher's experience will increase and as the time spent doing research increases. (Belkhodja and Landry, 2007: 317)

Collaborative projects and networking are vital to KM as system improvement depends on the multiple contributions among different stakeholder groups. Hence, more empirical work establishing a knowledge base on factors that encourage collaborative processes is necessary in the future to increase KM in public services.

Research use in Canadian organisations with explicit KM mandates

In a related study, Lavis et al (2003a) conducted a postal survey of 265 directors of organisations involved in transferring research knowledge to healthcare providers. Unlike the Landry study, which collected data from individual researchers, this study focused on research groups with an explicit KM mandate. The authors found that even in organisations with such a mandate, only about one third had developed strategies beyond the simple transmission of research reports or had 'actionable' messages. Only about 20% of the organisations did regular work to build knowledge transfer skills in their own organisation or take-up capacity in their target organisations. Many of the transfer mechanisms were passive, including predominantly the use of websites (to be discussed later), and only 10% had any formal evaluation of the impact of their work. In short, dissemination efforts are still quite modest.

Further support for these views comes from work done by our team. Our initial analyses from two studies (reported later in this paper) also show that 'producer push' efforts remain fairly small in most settings. Our analysis of websites of nearly 200 organisations involved in KM in education reveals generally low levels of effort (Sá et al, 2009). Organisations focused mostly on posting research products rather than organising events and building networks, even though the literature suggests that passive strategies (such as producing and posting research-related products online) have less impact than research-related events and networks that allow face-to-face interaction (Graham and Logan, 2004; Barwick et al, 2005). Our study of faculties of education also shows that most faculties have very modest programmes of research sharing or KM, relying primarily on efforts that individual faculty members choose to make (Sá et al, in press). This is not to diminish the extensive efforts of some individuals in universities and other research settings to increase KM (such as the teams mentioned in this paper); however, institutional initiatives that depend on extra efforts by a few people are not sustainable. Instead, organisational and systematic approaches are needed across institutions, especially in terms of increasing collaboration and networks among relevant parties. In this regard, universities make far less effort around KM in the social sciences than they do in the natural sciences or applied sciences, where industry liaison and technology transfer are well-developed functions with dedicated staff.

Research use in Canada from research users' perspectives

Whatever researchers or their institutions may do to share their work, the critical point is whether and how research actually is used by policy makers and practitioners. Both the Landry team and the Lavis team have also examined this question. Amara et al (2004: 82–4) propose four explanatory models of research utilisation:

- *Engineering explanations* suggest that the uptake of university research depends on the characteristics of the research findings such as *content attributes of research* (compatibility, complexity, observability, trialability, validity, reliability and

applicability) and *types of research* (basic-theoretical/applied, general/abstract, quantitative/qualitative, particular/concrete and research domains and disciplines).

- *Organisational interests explanations* assume that the size of agencies, organisational structures, types of policy domains, needs of organisations, and positions (professionals or managers) may affect the propensity of professionals and managers to utilise or underutilise university research.
- *Two communities explanations* assume that a cultural gap between professionals in agencies on the one hand and university researchers on the other leads to a lack of understanding between them and, consequently, to low levels of research uptake.
- *Interaction explanations* focus on the role of social linkages between the users and the researchers. These explanations assume that the interaction between researchers and potential users is one of the most important predictors of research utilisation.

The authors go on to operationalise these variables and measure them using a survey of 833 government officials in Canada to assess their uses of university-based research. Their respondents indicated that university research led to concrete action for 12% of respondents, conceptual utilisation for 22% and symbolic use (ie the research was considered or referenced but did not influence either thinking or action) for 16%. The authors maintain that taken together 'these results suggest that the three types of use of research play simultaneously a significant role in government agencies' (2004: 99). While we hope that this is true, relying on self-reported use by governmental officials may lead to overstating the current role of research in government agencies. We think that while progress is being made in small increments, the bulk and critical mass of the work is on the horizon rather than behind us.

This study also found that research utilisation levels vary based on the policy area. According to Amara et al (2004: 99): 'policy domains like education, health, and social services rely more intensively on conceptual, symbolic and instrumental use of university research than other policy domains'. They also found that policy domains tended to be relatively high or low on all three kinds of use. That is, those who prioritise and value research use are likely do so in a variety of ways. Amara et al (2004: 99) also found that their four explanatory models of use (mentioned previously) do significantly explain the instrumental, conceptual and symbolic utilisation of research. Due to the breadth of variables covered by engineering explanations, organisational interests explanations, two communities explanations and interaction explanations, this comes as no surprise. The more important question (and one that Belkhodja et al, 2007, begin to explore) might be which of these explanations impacts research use the most? To answer this question, future empirical work will need to disaggregate overarching categories, in order to distil the impact of each variable within each of these categories.

In a similar study, Lavis et al (2003b) surveyed more than 150 health policy decision makers around their knowledge of population health. They found that respondents (with the exception of finance ministry officials) were overwhelmingly aware of population health and thought it highly relevant. Two thirds of respondents felt that population health research had influenced government decisions, but their awareness of specific studies was more limited, and they felt they needed to know more about

specific actions that could be taken to support appropriate measures for population health. In fact, 83% of civil servants said that they need more information about the health consequences of the policy alternatives their departments face.

These studies support the well-established idea that 'use' is itself a multifaceted idea and should be understood keeping in mind that, as noted earlier, people may not themselves be aware of the sources of their ideas or actions (Weick, 1995).

Measuring research use at organisational and system levels

Much of the empirical literature conceptualises research use in terms of individuals and focuses on the individual level (Nutley et al, 2007); however, research use is actually a social function that is deeply affected by organisational and system features (Levin, 2008). A recent study by Belkhodja et al (2007) attempts to address this oversight by exploring the extent and organisational determinants of research use in the Canadian health system, by surveying 928 managers and professionals in ministries, regional authorities and hospitals. This study is one of the first we have found that models knowledge utilisation in terms of specific organisation variables:

> In past studies, the organizational determinants of knowledge utilization have been placed in a holdall category that ignores the essence of each organizational determinant. For example, the users' context, which is a utilization determinant, is made up of numerous dimensions that utilization studies neglect to report. This context is essential to better understand the dimensions underlying so-called organizational factors if we are to appropriately model knowledge utilization. (Belkhodja et al, 2007: 378)

Belkhodja et al (2007) assessed five organisational variables: absorptive capacity (measured by size of research unit and number of paid research positions), organisation culture (measured by research being the preferred source of information combined with the intensity with which research sources are used), adaptation efforts (users' efforts to acquire research and adaptation of research products to users), learning (measured in terms of the percentage of time allocated to research, research relevance, the most advanced university degree completed, training activities, and users' experience in research) and facilitation mechanisms (measured by the intensity of links between research suppliers and users). Their findings suggest that the most important organisational determinants are formal linkages between relevant parties and users' experience in research, followed by unit size and research relevance to users, but they also found that different organisational determinants vary in impact depending on the type of organisation. For instance, training activities related to research were non-significant variables in ministries and regional authorities, but significant in hospitals. Research relevance was a non-significant variable in ministries, but significant in both regional authority organisations and hospitals. A surprising finding was that adaptation efforts (research results in plain language, examples of how to use the results, implications for practice and visual appeal) had no impact on how much research was used in all three types of health organisations. Belkhodja

et al (2007: 406) concluded that 'research utilization in health service organizations is sensitive to learning variables, linkage mechanisms, organizational culture and certain variables reflecting the capacity to absorb knowledge'. Although there are likely competing perspectives on how these variables are operationalised, and why some indicators were chosen as compared to others that could have been chosen, the study remains groundbreaking in that it begins to try to quantify what many view as intangible features of organisations such as learning and culture. A better understanding of the organisational determinants that are *most* important to effective KM will help organisations better identify areas for improvement and also help them target resource allocation to maximise impact within their particular context. Ministries versus practice organisations (such as schools or hospitals), for instance, need to focus on different areas to optimise KM because of their different mandates, roles and contexts within the shared systems.

A further article by Lavis (2006) addresses the problem of fitting the world of research production to the world of research use in policy and practice. Lavis agrees with many others that the worlds of policy and research operate with different timelines, incentives, pressures and ideas about evidence. Lavis stresses the importance of personal interaction between researchers and potential users as a key element of the process. He also argues that 'knowledge-translation processes should be undertaken on a sufficiently large scale and with a sufficiently rigorous evaluation so that robust conclusions can be drawn about their effectiveness' (2006: 43). Evaluating progress of KM initiatives is essential to determining what works in what contexts; likewise, we need to begin to ask questions and design research methodologies that allow us to explain why research use, uptake and impact are prolific in some settings with failure to launch in others. It is only through disaggregating the multiple factors and further compartmentalising them that we may hope to answer these questions (for example, when looking at interaction between producers and users, what is the quality of the interaction, how are these processes best supported, what frequency is necessary and who should facilitate these interactions?).

Areas for further work

Redesigning surveys to minimise pitfalls of self-report

The research reported in this paper advances our understanding of KM and also raises new questions and issues. These studies are among relatively few that gather empirical data on the reported activities of researchers and research users in relation to KM. Although self-report is clearly a vehicle with significant limitations, it is at least a starting point. As a result of these investigations, both research teams have contributed ideas that could form the basis for further and more sophisticated empirical work. Systematic large-scale studies to build this knowledge base, as well as metrics to assess and measure the progress and impact of research on the various spheres of public systems, seem particularly important areas for development.

One important need is to find ways of assessing KM activity other than through self-report. This is a problem common to many areas of social science. One way to

address this concern is to shift our questions from matters of opinion to matters of fact. One option, described briefly later in our own work, asks school and district respondents about the existence and frequency of specific practices or behaviours rather than asking about attitudes. While one still cannot be fully confident in the accuracy of this reporting, responses with a factual base seem less likely to be affected by social desirability, are easier to check and are easier to compare among respondents in the same organisation.

Disaggregating categories influencing research use

A second need in improving KM research is to move past formulations such as 'research use is complex and multifaceted', to describe that complexity and its component elements so that these can be analysed and assessed. For example, one of the key considerations is whether there is an infrastructure (people, policies, systems, processes) that supports and facilitates KM, whether in research or in practice organisations. The components of this infrastructure can be mapped and studied empirically. Another example is the organisation of practice in organisations that are potential users of research. The ways in which work and learning are organised in schools or hospitals, and among different professional groups, have important implications for the organisation of KM activity. Again, these are factors that can be analysed and studied. The studies described in this paper are helpful in specifying constituent elements of KM work but there is more to be done to support the design and implementation of effective interventions that target the areas that have the greatest potential to improve systems.

The potential role of third party organisations

The Landry and Lavis teams also draw attention to the importance of specific mechanisms through which research is communicated and taken up in various ways, including the critical work done by intermediaries of various kinds, whether individuals or organisations. The importance of linkage mechanisms and facilitation between research producers and users is emphasised throughout the literature and empirical work (Lavis et al, 2003a; Lomas, 2007; Nutley et al, 2007; Levin, 2008; Sin, 2008); hence, third parties have the potential to play an increasingly prominent role in KM initiatives in both health and education. In fact, in many ways, they are already playing noteworthy roles. For example, providers of professional development to teachers and principals play a powerful role in the spread of knowledge about research, and the same would be true for doctors or nurses in healthcare. Coverage of research in professional publications of various kinds is another important third party KM mechanism. Then there are organisations explicitly dedicated to changing policy or practice, which use research to support their work, such as CHRSF in Canada in healthcare, the Canadian Council on Learning in education, international organisations such as the OECD and lobby groups on specific issues such as special education or early childhood education. The work and ideas of these organisations can sometimes have powerful impacts on professional understandings about research. We

need to examine third party KM organisations much more extensively and to gather empirical evidence on who they are, what they do and how their role may improve KM across the many organisations within shared systems. Third party organisations with explicit KM mandates, such as think tanks, may also be a fertile source of learning more about KM processes as well as tapping into their experiences regarding what works in what settings and why.

The role of graduate students as bridges between research and practice worlds

Both research teams have also stressed the importance of creating mechanisms and processes to support good interaction around research issues, noting that, like any issue, this one requires explicit attention if improvement is to occur. A particular aspect of this issue of interest to our team, although not one explicitly stated by the Landry or Lavis teams, is the potential role of graduate studies and graduate students. Graduate students in education are predominantly administrators and practitioners working full time in the field; hence, they could serve as bridges between research and practice because they are immersed in both contexts simultaneously. Although graduate students inhabit these dual roles, they are typically not used as intermediaries by either research producers or users in the social policy fields. An explicit focus on developing these practitioner-researchers into intermediary agents between university researchers and schools has the potential to be a productive linking mechanism.

Each of these lessons has been taken up in the empirical work of our research team, described in the next section of this paper.

Research Supporting Practice in Education (RSPE) programme

Our KM team at the Ontario Institute for Studies in Education (OISE) is comprised of faculty members and graduate students. Our Research Supporting Practice in Education (RSPE) programme, supported with funds from the Canada Research Chairs programme, is designed around utilising research to improve policy and practice in education. We are conducting a number of empirical studies in different areas of education, including secondary school systems and faculties of education, as well as analysing more broadly KM strategies utilised on websites of educational organisations. One of our conclusions from our own work and that of others is that KM efforts can be described as involving the creation of products (such as reports), events (such as conferences) and networks (ongoing interactions among groups of people). We now describe our activities under these headings briefly and then discuss the empirical work we are doing.

Products

Our website (www.oise.utoronto.ca/rspe) provides a number of products intended to be useful to those studying KM. Since the field is full of diverse terminology, we have created a *chart of terms* used in the field by various researchers and also make

available some of the *conceptual frameworks* we have found in the literature, culled from various disciplines. Other products on our website include an *annotated bibliography* of studies and reports on KM, links to some of the many *electronic bulletins* and newsletters that currently communicate the results of education research, *links* to other websites that have interesting KM practices and to other organisations or individuals who are studying KM, and *access to reports, papers and presentations* done by members of the project team. All of these resources are accessible without restrictions – no registration procedure or fee is required.

Events

KM is a social process. Our KM team supports its own social learning by organising itself as a 'lab' of interested scholars and graduate students who work on projects together and meet regularly for discussion of common issues. We also support a seminar series with various local and international experts, and work with several partner organisations – to be described more fully shortly – to create broader research networks.

Networks

The literature on KM suggests that networks are potentially a powerful avenue to change practice because they create ongoing social contact, which is most likely to affect behaviour (Gilchrist, 1995, 2000; Watson et al, 2002). RSPE is attempting to facilitate learning about KM through building collaborative interaction between KM scholars and specialists in different disciplines and countries. We maintain a listserv for sharing ideas and resources on KM, which involves some 100 people in 10 countries. We are also trying to build a *wiki* for collaborative development of a synthesis of what is known about knowledge mobilisation and how we know it. The wiki development is being carried out by an invited group of experts but a current version will be posted on the public website with visitors welcome to comment.

Although networks are recognised as a powerful medium to share knowledge and effect change, they are difficult to build and maintain (Gowdy, 2006). Our various partners have welcomed both the listserv and the wiki, but participation in both remains low. Although people often express interest in KM activities, they may find that they simply do not have or cannot find the time to participate to any significant degree. Creation of networks cannot be a passive process because most people already have a full plate of demands on their time and thought. Those interested in building networks must take active steps to foster and facilitate involvement.

Empirical studies

The OISE KM team currently has four empirical studies under way through RSPE that are exploring KM issues.

Research use in Canadian secondary school districts

The first mixed-methods study, funded by the Canadian Education Association, is investigating research use in secondary schools by surveying educational leaders from 11 districts across Canada. It is investigating district research culture, leaders' knowledge about relevant educational research, and the effect of interventions on research knowledge and using pre- and post-intervention quantitative survey data as well as qualitative data collected from implementing interventions in nine school districts to increase research use.

In the first phase of the study, rather than ask practitioners about their perception or opinion of how much research use is occurring, we asked about frequency of specific research-related practices that the literature suggests are connected to greater KM. In particular, we focused on activities that involve creating connections among people, since the available evidence indicates that these connections are most powerful in changing what people do (Levin, 2004, 2008; Nutley et al, 2007; Cordingley, 2008). The 188 respondents to our initial survey (superintendents, principals and vice-principals) provided data on research use, research-focused events, school practices, reporting and analysing various data sources, and research activities (events, resources and networking) in their districts. Our initial findings suggest that while people say their schools and districts use research, when one looks at specific practices there is only limited KM effort occurring in most cases. Schools and districts tend to lack formalised research capacity, resources or time to engage with research.

The study also asked education leaders about six knowledge claims pertaining to success factors for secondary school students that are widely supported in the research. We found general agreement among our respondents on three of the claims but considerable disagreement on the other three. Where knowledge was most consistent with the research, we also found a higher degree of reported awareness and use of research. For all the knowledge claims, respondents report multiple sources of influence on their views, suggesting that many different information sources can matter. Respondents reported for all the claims that personal experience was the most powerful influence on their views, followed by colleagues or professional networks. Direct contact with formal research sources and professional development appeared to play a weaker role in shaping opinions across all the districts.

The second phase of the study involved collaborating with nine school districts to implement three interventions to increase research use throughout the 2008/09 school year. The specific content for all three interventions was related to the three knowledge claims on which there was less agreement:

- *System to share research articles:* The first intervention involved providing districts with some readily available sources of good research on secondary schools and student success (newsletters, websites, readings), which were distributed and used as each district chose.
- *Study groups around research issues:* The second activity involved creating study groups of district leaders (six to 10 people in a group) who met three times during the school year to discuss important research on secondary school improvement.

Districts were provided with the relevant material (including executive summaries and guided questions).

- *Districts conducting research:* The third activity implemented an intervention to track former students' post-high school destinations and use these data to inform district planning for secondary schools. Districts were provided with a methodology and survey instrument for this activity, which was carried out by secondary students as part of a course.

The three interventions varied in intensity, with the first being the most passive and the third being the most active. We were interested in knowing if more intensive interventions would produce a greater impact than more passive ones. To this end, we readministered the survey following the interventions. We did not find significant changes in knowledge levels in the post-intervention survey, although this may be in part because many survey respondents were likely not involved in the interventions, which in most districts reached only small numbers of people. The full report of this project will be posted in late 2010 on the RSPE website, including the additional resources we used for each intervention. This approach is based on the suggestion by Lavis et al (2003c) of measuring the impact of interventions by assessing a change in awareness about a particular body of research knowledge. Our goal is to see whether relatively simple interventions such as these can actually change educators' use and knowledge of research. An interim report for this study is available at www.oise.utoronto.ca/rspe/Empirical_Studies/CEA_Research_Project_.html.

Research use in Canadian and international faculties of education

Our second study is examining KM in faculties of education in Canada and abroad, connecting their efforts or lack of them to areas identified in the literature such as research characteristics, incentives, institutional support, and social norms. The first phase of the project involved interviews with 15 deans of faculties of education. The second phase of the project surveys the KM practices of Canadian researchers who have recently held major research grants, including institutional supports for KM, target audiences, dissemination strategies and tools, and perceived impact of their research. We also hope to learn more about the effectiveness of these strategies. An initial analysis of university websites as well as analysis of interview data suggest that most universities are only modestly involved in KM practices at an institutional level. There were, however, a few isolated practices occurring in two faculties of education of the 10 studied. Examples included: stating KM explicitly as an institutional priority and in strategic planning; targeting funding towards KM efforts through linkage grants, which require partnerships and collaboration between researchers, industry stakeholders and government officials to galvanise increased alignment between research, policy and practice; and creating formalised roles and responsibilities with half the time of a faculty member designated to managing KM efforts. We expect that the results of the research will be of considerable interest to universities and educational research sponsors as they will provide a stronger empirical basis for making decisions about

how best to support KM work. More details on this study are available at www.oise.utoronto.ca/rspe/Empirical_Studies/index.html.

KM practices utilised on educational organisations' websites

The third major project is an analysis of KM practices being used on educational organisations' websites as indicated by research-related products, events and networks. Electronic vehicles related to the Internet have become a, if not the, primary vehicle for communicating research and virtually every organisation is using its website to this end. We have developed inductively a common metric for assessing the degree of KM work as revealed on websites. We have used this metric to analyse nearly 200 organisation's websites and have found that very few organisations display a range of practices related to KM, and many organisations, even those with apparent KM mandates, have virtually no KM activity. Where KM activities do exist, they tend to focus on posting research-related products online, with far less attention being paid to building interaction through events or networks. Our intent is to give organisations an assessment tool with which to measure their KM practices as well as information about exemplary practices. More details on this study are available at www.oise.utoronto.ca/rspe/Empirical_Studies/index.html.

Use of web-based research materials

The website analysis has led us to ask how much use all these websites and web products are actually getting, a subject on which there is very little evidence despite the large investments being made in the websites. This study involves our team partnering with educational organisations in Canada and abroad to investigate use of web-based research in education. Each partner organisation is involved in attempting to share research information in education through making it available on their website.

The study uses two data sources to assess the extent and nature of use of research products found on the websites of participating organisations. First, web analytics track website usage in various ways (eg hits, page views, time spent on research pages, downloads, and so on). Second, we developed a two-part survey, administered at two different points in time, that asks visitors directly about their use of these web-based resources. The first part of the survey asks questions about why the person has visited the website and what resources, if any, they have found relevant to their needs. The second part of the survey is sent to people who download research resources (and agree to participate) at a later date to find out what they actually did with the research product. We expect that these tools will start to answer the question of the degree to which the investment in web tools for research dissemination is effective. More details on this study are available at www.oise.utoronto.ca/rspe/Empirical_Studies/index.html.

Common trends across our empirical studies

Across our activities and empirical studies through the RSPE programme we find a lack of systematic approaches to KM in education. This work appears to be prioritised neither by the organisations that are the main producers of research (faculties of education) nor by 'receiving' organisations (districts and schools). While there is growing momentum globally surrounding KM efforts, much work remains to be done, and much to be learned if research is to have the impact it might on education policy and practice. Our work so far suggests that improved KM in education requires a number of actions. These include, in brief:

- recognition of KM as an institutional priority for all parties;
- formal institutional structures and processes to support KM;
- embedding KM in the daily work of professionals;
- resources and incentives to promote KM;
- formal KM roles to make sure that the work gets done;
- more venues to collaborate and engage in KM work.

Conclusion

Clearly, KM has not reached its full potential in education or social policy. Some gains have been made, notably a growing interest and activity internationally, and a small but growing empirical base surrounding KM. There are islands of excellence amidst the sea of partial and ad-hoc activity that dominates the landscape; so, there is potential to learn more, and to improve theory and practice, especially by adopting a more systematic approach. There should be particular interest in ideas and strategies that can be done quickly and easily to improve KM almost immediately in any organisation, as opposed to the frequent focus in the literature on changes that are very difficult to make, such as changing tenure practices or changing political cultures. Any organisation can improve its website or place a research discussion on an already scheduled meeting agenda, and these small changes will matter over time.

Overall, we still have a long way to go before KM is the norm across our educational institutions but our studies speak to a number of professionals with the energy, will and enthusiasm to undertake the important work of strengthening connections between research, policy and practice. In the end, we all benefit from an improved education system including, most importantly, the students in our schools.

Note

[1] We use a variety of terms such as 'knowledge mobilisation', 'knowledge utilisation', 'research use', 'research uptake', 'research impact' and 'research value' interchangeably to represent the contribution of research to other spheres of life. Each term has its own value; none is ideal.

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Amanda Cooper (amanda.cooper@utoronto.ca),
Ben Levin (ben.levin@utoronto.ca),
Ontario Institute for Studies in Education, University of Toronto, Canada