Researching research use:

An online study of school practitioners across Canada

Larysa V. Lysenko

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ABSTRACT

Researching Research Use: An Online Study of School Practitioners across Canada

Larysa Lysenko, Ph.D.
Concordia University, 2010

Because of its traditional role as an enabler of knowledge dissemination, education is expected to contribute substantially to the development of the knowledge economy. This means applying the knowledge that it generates through research to its own practice. Yet the literature shows that school practitioners do not express much demand for research findings, unlike doctors, engineers and other professionals.

The purpose of this pan-Canadian online survey study is twofold. First, it investigates the extent to which school teachers, principals and professionals use research to inform their practice and indicates predictors of this use. Second, it tests the generalizability of a questionnaire originally developed within a provincial secondary school context.

The 43-item questionnaire yielded 1,153 responses. Frequency of use of research-based information from a variety of sources and types of use were used as outcome measures. The questionnaire also explored practitioners' opinions about research, their attitudes towards research awareness activities and their expertise to use research findings, as well as the constraints they contend with in everyday practice.

The results indicate that the three groups of practitioners either do not use educational research or use it infrequently. Although the respondents share neutral attitudes towards research, their comments add a negative connotation by qualifying

research as irrelevant, and biased. The latent factor *opinions about research* is the greatest predictor, accounting for 9-16% of the variance in practitioners' use of research. The psychometric qualities of the questionnaire remain stable. Its internal reliability is 0.94. The four-factor solution explains 60% of variance and together with demographic variables predicts 22% of the frequency of use of research-based information.

School leadership organizations, teacher education institutions and research-generating bodies stand to benefit from the study's findings, 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. Future research should further explore the reasons why practitioners do not use research-based information and the ways to change school practitioners' negative perceptions of educational research. Refinements to the questionnaire and its cross-disciplinary comparison to other professions are also open for future inquiry.

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DEDICATION

I dedicate this thesis to all the significant people in my life:

To my parents, who I am so lucky to have as my mom and dad,

To my daughter, who is the echo of my heart, and

To my husband, who makes all possible.

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Chapter 1

Introduction

Society has always valued knowledge for its potential to improve the quality of life, as is best summarized in Francis Bacon's famous dictum "scientia potentia est." Clearly, a concern for making knowledge accessible, useful and beneficial for the public is not new. Among the first attempts to educate the public about science, history, literature and ethical issues was the *Penny Magazine* published by the Society for the Diffusion of Useful Knowledge, in the beginning of the XIX century (Smith, 1974). Today with the rapid growth of science and technology, expertise and know-how, intellectual capital has ceased to be the privilege of the elite, but instead has become a productive force, as critical as traditional economic resources, jump-starting the knowledge-enhanced economy. Consequently, a variety of approaches geared to making knowledge actionable and serving the public good have evolved. These include knowledge mobilization, knowledge-to-action, knowledge transfer, innovation diffusion and evidence-based policy and practice (Graham et al, 2006).

Traditionally known as a "house of knowledge," school is now expected to contribute intensively to the development of the knowledge economy. However, despite numerous attempts to raise the effectiveness of education, students still fail to achieve high competence results in a shorter time and at a lower cost. Thus, being far from what is desired, the status quo in education raises vocal dissatisfaction. On many occasions (for instance, Hargreaves, 1996; Davies, 1999; Slavin, 2004), the pace of progress in

education has been compared with that in medicine and engineering (although not to the credit of the former). It has been pinpointed that the scientific knowledge base and its utilization for practical decisions, as the hallmark of any major profession ensuring its steady advance, is not part of the teaching profession (for instance, Glazer, 1975; Abbott, 1988; Ingersoll, 2003). Instead, the craft knowledge paradigm dominates. Slavin (2004) described it eloquently, "If Rip Van Winkle had been a physician, a farmer, or an engineer, he would be unemployable if he awoke today. If he had been a good elementary school teacher in the 19th century, he would probably be a good elementary school teacher today" (p.16). This is not a mere assumption. The traditionally weak role of research in educational practices was highlighted by the few empirical studies comparing teachers with other professions, such as doctors and engineers (Beard & Williams, 1992; Hannan, Enright & Ballard, 2000; Latham, 1993).

It is clear that school success is largely dependent on classroom practice, but it is also a result of the concerted action of various groups of practitioners, such as school administrators, school psychologists, nurses and counsellors. Professional standards and job duties can make them more prone to use research findings and school data to implement a treatment protocol with high fidelity or to make decisions about correcting gaps in the curriculum and instruction. Nevertheless, empirical evidence reveals that research knowledge should have more visibility in the practices of these occupational groups (Adams & Barron, 2009; McCaffrey & Hamilton, 2007; Meline & Paradiso, 2003; Torrence, 2002).

Empirical and conceptual research suggests the existence of forces that mediate what practitioners do. These forces may either cut the distance between research

knowledge and practice or, on the contrary, widen the gap. Davies (2004) posits that besides the research product itself, individual habits, experience, expertise and judgement, pressure groups, school values and traditions may play a dramatic role in practitioners' decisions to get involved in the processes of educational change.

Broader systemic trends such as educational policy shifts at the federal and provincial levels should not be ignored for their potential to affect school practice. Over the last 10 years, the educational systems in Canada's various provinces have been undergoing dramatic changes. While some of these changes (such as the emphasis on accountability and the desire to professionalize the teaching profession) seem to be common to the various regions, each province undertook specific efforts that may have affected, to different extents, the status of research knowledge in educational practices. According to Louis (1998), structures fostering institutionalism versus organizational learning use distinct mechanisms, strategies and structures to promote the use of research. For example, in a review of education governance in Canada, Lessard and Brassard (2005) analyzed provincial and territorial approaches to education governance. Some jurisdictions promote school choice and perceive parents and students as clients relying on command-and-control mechanisms through tight accountability regimes to manage school authorities. Others, meanwhile, continue to make advances on decentralized, community-based approaches to governance, counting on individual choice and collaborative involvement.

It is, therefore, useful to capture factors affecting utilization of research in school practice by painting a group picture of various categories of school practitioners in a variety of parallel educational contexts.

This research study was designed to contribute information gained by surveying school practitioners across Canada and primarily attempted to answer the following main questions:

1. How do groups of school practitioners in Canada vary in their use of research as a driving force for school improvement?
2. What are the predictors of use of research by school practitioners across Canada?

Supporting questions were:

What sources of research knowledge are favoured by school practitioners?

What kind of knowledge (produced in academia or school-based research) do practitioners prefer to use in their practice?

What uses of educational research are made by school practitioners?

How do educational practitioners perceive research evidence?

What appraisal skills and professional competencies are necessary to apply research findings in practice?

What methods and strategies are important to make educators aware of research findings?

What contextual and setting factors (available resources, nature of the school culture, external causes) are important for the use of research knowledge to inform school practice?

The study explored this set of questions in regard to a) practitioners' individual characteristics, such as level of education, teaching experience and prior involvement in

research; and b) school characteristics, such as school size and socio-geographical location.

Secondarily, because a few existing instruments evaluating aspects of research knowledge use in educational practice are limited in their capacity, this study also aimed at testing the psychometric properties of the questionnaire originally developed to measure Quebec secondary school practitioners' behaviours and attitudes towards the use of research. Specifically, it was geared at broadening the scope and the generalizability of the self-reporting measure on pan-Canadian sample of school practitioners by examining whether the questionnaire qualities will change if

1. Primary school practitioners are added to the sample; and
2. The sample includes school practitioners from different jurisdictions in Canada.

Chapter 2

Review of the Literature

In an attempt to situate this study within the field, a number of major challenges became evident: a) differences in approaches used to conceptualize knowledge utilization and transfer; b) abundance of conceptual models and thinness of the empirical base; c) variations in the quality of the design and methodology of the available research on knowledge utilization; and d) lack of purposeful comparative studies.

In the following sections, a synthesis of the conceptual and empirical literature is presented to provide the ground for this study. Section one overviews the debate about the role of educational research in the framework of a professional knowledge base for school practices. Section two focuses on the multidimensionality of knowledge use. A variety of predominantly theoretical approaches to conceptualize the process of knowledge transfer have been summarized in section three. Section four presents empirical evidence about the use of research-based information by school practitioners and factors affecting practitioners in their decision to use research-based information. An analysis of the available measurement scales has been included.

Conceptualizing the Research Knowledge Base

For decades it has been noticed that accumulated research knowledge has little effect on improving practice in the classroom, since it has not been used routinely to inform school practice (Glazer, 1974; Abbott, 1988; Huberman, 1989; Ingersoll, 2003). Lack of agreement in what makes a research knowledge base actionable is one of the

reasons that accounts for the low practical use of educational research (McNamara, 2002; Hammersley, 2004; Cochran-Smith, 2006), which boils down to the debate about which type of research produces knowledge with the potential to guide professional practice across educational contexts.

On the one hand, it is argued that to make genuine generational progress in education possible, research is required to lead practitioners to larger questions about effective educational practices and "what works" (for example, Slavin, 2002). Consequently, randomized-control trials (or quasi-experimental research at the least) and reporting effect sizes (that is, the standardized magnitude of an intervention over its alternative) have been claimed as the preferable protocols capable of ensuring the quality of evidence in education and possessing a potential for implementation across a large number of contexts.

On the other hand, because true experiments fail to capture the complexity, depth and contextual sensitivity of educational processes, calls have been made for a broader and more inclusive view of evidence-generating procedures that include, but are not limited to, the "gold standard" of research design. Shifting emphasis from purity to methodological pluralism allowing for complimentary contributions, the educational community is attempting to build up a broader methodological framework, resulting in the development of the mixed method model of research (for example, Johnson & Onwuegbuzie, 2004). Gorard and Taylor (as cited in OECD, 2007) suggested the idea of a larger cycle of educational research, where all methods have been recognized for their valid purpose and contribution at a certain stage of inquiry about an educational issue.

Privileging knowledge generated in universities and research institutes over evidence that comes from professional teaching practice is yet another aspect of the "evidence" problem. It echoes the post-modernist philosophical debate on the nature of knowledge, with objectivism arguing for the objectivity of some knowledge and constructivism stating that all knowledge is local and contextual. In an attempt to find middle ground between two perspectives, Hammersley (2004) and McNamara (2002) argue that internal professional judgement based on practitioners' "soft" data or tacit knowledge, such as practical evidence and an understanding of local contexts, educational values and beliefs and intuitive experiences, are legitimate components of the evidence "blend." The concept of "practice-based evidence" evolved to name evidence coming from everyday practice and used to make professional decisions (Eraut, 2004; Simons, Kushner, Jones, & James, 2003). "Evidence-informed" policy emphasizes the decisive judgement of potential users in the process of selecting evidence and using it for their practices (Davies & Nutley, 2001). In a way, evidence-based practice also tries to minimize the differences between external and locally produced knowledge. Davies (1999) and Hargreaves (OECD, 2000) argued for the necessity for educational practitioners to establish sound evidence where existing evidence is lacking or is of questionable, uncertain character and called on practitioners "to plan, carry out and publish studies" (Hargreaves, OECD, 2000, p.109). Thus, along with university-based research, locally produced knowledge in which practitioners perform direct roles, which is notable for its contextual character and relevance to educators' everyday practice, has been recognized as an inherent constituent of evidence in education (King, 1995; McIntyre, 2005).

In this study, the narrowest perspective is taken on the definition of evidence (Dagenais, Janosz, Abrami, Bernard & Lysenko, 2009). The term "research-based information" will be used to imply a relatively freely circulating, formalized scientific commodity produced by professional researchers (general research) or practitioners, either in collaboration with researchers or independently (local research). Both stances may share the same approaches, methods and rigour. It should be acknowledged that, although scaffolding provided by researchers for practitioners may lend consistency and rigour to the locally produced research, it is difficult to judge its effectiveness. As Shaddish, Cook and Campbell (2002) posit, no comparisons of effects of locally generated versus generally produced research or externally imposed solutions have been performed so far.

Concurrently with the challenge of conceptualizing the notion of educational evidence, there is not much agreement in what the notion of knowledge utilization means in the context of desired educational improvement.

Conceptualizing Use and Its Dimensions

"Utility" or "usability" has always been a major sought-after attribute of research findings, although what it means is quite ambiguous. Dunn (1986) explains that an initially unitary concept, where utilization meant complete adoption and application, gradually evolved into a multifaceted construct comprising not only direct, but also alternative forms of use, as well as non-use, misuse and abuse. Caplan and Rich (1976) were the first to point out that "people do not utilize research the way they utilize the hammer" and make the basic distinction between instrumental and conceptual types of utilization.

"Instrumental" utilization views the use of research-based information as a fairly direct, rational or linear process and is primarily concerned with the change of concrete practices (Hutchinson, 1995). According to this perspective, the process of utilization crowns a chronological sequence, from creation through dissemination, to be used where external research findings are being transmitted and applied intact. Thus, instrumental use in its pure form is restricted to low-level decisions where users' interests are unaffected (Weiss, 1980). In 1976, Larsen and her team (as quoted in Larsen, 1981) took a step further in their attempt to define "use." Apart from the utilization of information as originally presented, they discriminate between partial implementation of information, its modification to meet users' needs and non-utilization. The non-utilization distinguishes between intended when research was considered and rejected and non-intended when nothing was done.

Focusing on instrumental use as the most desired utilization outcome, a number of scales were developed to capture the utilization mechanism. First developed in the 1950s, the theory of innovation diffusion (Rogers, 1995) presented utilization as a sequence of steps: awareness, persuasion (attitude), decision (adoption or rejection), implementation and confirmation. This model informed the work of others. Trying to evaluate the degree of program implementation, Hall, Loucks, Rutherford and Newlove (1975) identified a spectrum of decision points of use from "non-use" to "renewal" when the user re-evaluates the quality of use. Another example is the renowned scale by Knott and Wildavsky (1981), who call the stages of utilization (reception, cognition, reference, effort, adoption, implementation and impact) standards and represent each of them as links in the utilization chain. Their scale has been elaborated on by Landry, Amara, and

Lamari (2001) and further by Estabrooks, Floyd, Scott-Findlay, O'Leary, and Gushta (2003). Landry et al. (2001)'s perspective views stages as increasing the impact of research on practice: transmission of research; cognition of findings; reference to significant studies; efforts to operationalize findings; influence on decisions; and application of research to policy and/or practice. Despite the fact that these scales attempt to explain the proportion of utilization outcomes, they are heavily critiqued (Davies, Nutley & Walter, 2005), first, for keeping the linear tradition of utilization, where all stages are equally important, sequential and cumulative; second, for relying on the single outcome measure, where too much focus and value is placed on the fruit of instrumental use; and third, for under-weighting or ignoring other dimensions of use.

Davies et al. (2005) admit that in practice, research utilization can rarely be a direct, instrumental and clearly identifiable process that can be captured and codified in tools and means, such as guidelines, protocols or organizational processes. More often, use brings about changes to individual understanding or attitudes. Thus, to describe the process of "gradual sedimentation of insights, theories, concepts and ways of looking at the world" (Weiss, 1980, p.535), the terms "conceptual use" (Neilson, 2001) or "enlightenment" (Weiss, 1980) have been coined. In order to make sense of situations encountered in practice, practitioners use research as a source of inspiration to accommodate or modify their framework of reference. As Neilson (2001) states, this use encourages organizational changes in that it refers to influencing processes for making decisions and policies. According to Hughes, McNeish, Newman, Roberts and Sachdev (2000), conceptual use helps make better choices from among available options that have been successful in other organizations or communities. Proponents of evidence-based

practice in education (for instance, Hargreaves, OECD, 2000) caution against the absolute value of education as "enlightenment" considering this view as a discouragement to applied research geared at producing direct impacts on policy and practice.

There is yet another aspect to research utilization. It is even less straightforward than conceptual use. In a private conversation, one of our colleagues put it eloquently, "Practitioners use evidence to confirm their practice not to change it." This use relates to manipulating knowledge to derive specific profit or to achieve power goals and was labelled "symbolic" or "strategic" (Hughes et al., 2000). More specifically, this use consists in utilizing knowledge and findings to support one's arguments in order to influence decisions, justify actions or support an existing opinion or decision that has already been made.

Recognizing distinctions between instrumental, conceptual and symbolic uses, Dunn (1986) considers it fallacious to juxtapose them as mutually exclusive or arranged as extremities of a continuum. Instead, all three should be interpreted as interrelated and co-existent dimensions (Cousins & Leithwood, 1993; Greene, 1988; Huberman, 1987). Sunesson and Nilsson (1988) emphasize that utilization may occur for one specific purpose or simultaneously for different ends. Notably, conceptual use, being an end in itself, is argued to generally prevail and precede the other two.

Despite these developments, little is known about the dimension or combination of dimensions necessary and sufficient to yield or drive educational change.

In his classical review of the literature on knowledge utilization in education, Havelock (1969) argued that a direct link between knowledge production and its

utilization hardly exists. Since then, a number of conceptual models, from unidirectional, interactional to participatory and multidimensional, have been developed in an attempt to describe the processes and actors involved in linking research and practice. The summary of the suggested models follows.

Knowledge Transfer Models

As summed up by Love (1985), existing models of knowledge transfer have as their ultimate goal descriptions of mechanisms bringing together research and practice. The direction of the initiating stimulus in the researcher-user interaction served as a criterion to group them in this study. The following four sections explore each of these groups.

Science-push models. "Technology-knowledge push" (Havelock, 1986) or "knowledge-driven" (Weiss, 1979) or "knowledge push" (Denis, Lehoux & Champagne, 2004) or "diffusion of innovation" (Rogers, 1995) or "science push" (Landry et al., 2001) models are based on the premise that it is the current state of scientific knowledge that drives practice. These predominantly centre-periphery or unidirectional models suggest that usable knowledge is "external" to the user. Being codified and treated as an object, knowledge moves from the world of research to that of action. Researchers play the leading role in the "producer push" model. Lavis, Davies, Oxman, Denis, Golden-Biddle and Ferlie (2005) argue that researchers market their own research by identifying their audience, explicitly planning and implementing strategies to push knowledge towards these audiences. Loci of transfer and communication paths between research and practice are the most important aspects of these models, which are looking to bridge the research-

practice gap. At the same time, the perception that high-quality knowledge is exogenous to practice and inevitably affects practice does not help the two communities approach each other (Landry & al. 2001). Instead, practitioners are isolated from the stages of evidence production and selection. Thus, these models are mainly critiqued for linearity and reducing the practitioner's role to that of research consumer.

Need-pull models. A need for knowledge reflecting concrete contexts of practices propelled the emergence of "need pull" or "problem-solving" (Denis et al., 2004; Havelock, 1969;Weiss, 1979) models, which have recently been referred to as "user pull" (Lavis et al., 2005) models. According to this perspective, the users of research-based information explicitly plan and implement strategies to pull knowledge from sources they identify as useful for their own decision-making. The utilization of research findings in practice increases if these findings provide concrete answers to user questions. Critical for these models are practitioner's skills to identify sources of information, to gain access to these sources, and to evaluate accessed knowledge about scientifically based practices (Louis, 1983). Environmental facilitators, such as the availability of technical assistance and liaison agents, are deemed vital for the user's pulling effort (McInerney & Hamilton, 2007). Although the user's decision to use research is essential for this model, the user's status remains restricted to the role of consumer of an external research product. Usability of research-based information and its applicability and value for practitioners and policy-makers become critical factors affecting use.

Exchange models. In the "exchange" models, research uptake is no longer viewed as either passive or active adoption by practitioners of externally produced

knowledge. Practitioners' active participation in the processes of knowledge creation, transfer and utilization are central to this category (Wiliam, 2002). The idea of involving practitioners in the process of research has been part of the progressive tradition in education for a while and goes back to the turn of the twentieth century, when John Dewey argued in favour of teachers' inquiry as a guarantee of students' learning success. Therefore a great deal of importance is given to joint action; co-operation; and collaboration between researchers, decision-makers and stakeholders during the knowledge creation, dissemination and appropriation phases (Landry et al., 2001). The more intense and regular the interaction between researchers and users during the phase of research production *in situ*, the more likely it is that the created knowledge will be used (Cousins & Earl, 1995; Landry & al. 2001). According to this approach, knowledge circulates and evolves in a bi-directional manner, and researchers share responsibility for the knowledge creation and utilization processes, together with stakeholders and practitioners (Blackburn & Demers, 1996; King, 1995). The aim of practice settings is to appropriate the entire research process, not just the end results. Partnership research initiatives are based on this model (Denis et al., 2000; Demers, 1997; Hughes et al. 2000). For example, participatory evaluation (Huberman, 1995) as a decision-oriented local inquiry built on the explicit collaboration of researchers and practitioners is geared to encouraging change processes and transforming schools into learning organizations. Having as its goal the simultaneous improvement of local practice and the generation of valid social theory, the action or teacher research model is also suggested as a strategy to bridge the gap between academic research and the professional craft of teachers (McIntyre, 2005). It should be noted, however, that results obtained as part of a particular

research project do not correspond to many quantitative researchers' definitions of scientific evidence, owing primarily to the fact that locally produced evidence may not be generalizable to other contexts.

Whole systems model. Having applied a whole systems approach, Walter, Nutley, Percy-Smith, McNeish, and Frost (2004) developed three nested models of research utilization. The basic "research-based practitioner" model embraces practitioners' knowledge and skills, as well as their autonomous decision to change their practice based on research. Thus, keeping up to date with research and applying it to practice are the responsibilities of the individual practitioner. This model is a part of a wider, "embedded research" system, in which research-informed practice is achieved by nesting research into the structures, such as standards, policies, procedures and tools, and processes, such as the application of assessment and evaluation instruments. Responsibility here lies more with policy-makers and managers. The third model, "organizational excellence," is an even broader system into which the above two are integrated. Its goal is to develop a research-minded culture within social agencies. The key is their leadership, management and organization and the collaborative creation of knowledge through local experimentation, evaluation and practice development. This approach involves partnerships with intermediaries, such as universities and independent research centres. The main tensions in these three models emerge around the degree of autonomy, issues of linearity versus networking and collaboration in the processes of knowledge creation and use. Although all three models have been claimed critical in the research utilization process as a whole, neither the mechanisms of how these models

interact nor the axes along which these interactions unfold to make up a complex unity have been clearly shaped.

The existing knowledge transfer models suggest a variety of perspectives on the critical aspects of the processes and the actors involved. Interestingly, each of these models is generally associated with a particular field. For example, in the field of medicine, the "science push" model is predominant. In contrast to the healthcare field, none of the existing models of educational research knowledge transfer received a formal status in education (Nutley, Percy-Smith & Solesburry, 2003).

Consequently, none of them has been evaluated for their effectiveness. At the same time, a number of empirical, predominantly exploratory studies focus on the utilization of research by school practitioners. The next section presents a summary of the empirical evidence on the use of research by various categories of educational practitioners and the factors affecting research utilization derived from primary research.

Empirical Ground: Educational Research in School Practice and Factors Influencing its Use

Struggling with the issues of what is research evidence in education and its utilization, the research community has not been extremely prolific in its attempts to study the impact of research on school improvement. Since 1985, when Love stated that the existing database of evidence on research utilization was extremely thin, the number of empirical studies has not changed a lot. The most recent systematic review of literature ranging from 1988 to 2001 about research use to improve professional practices by Hemsley-Brown and Sharp (2003) was able to identify two peer-reviewed papers

studying the use of research findings by school principals and four papers focussing on teachers' use of research. New searches of ERIC, Psychinfo and EBSCO electronic databases and the Internet, as well as manual searches and branching in combination with a more inclusive approach (both attitudes towards research and use of research findings were included) yielded a few more studies, both qualitative and quantitative and mixed. It is important to note that an extensive base of empirical research describing efforts to reduce the research to practice gap in special education has not been considered (for example, Gersten & Brengelman, 1996; Duchnowski, Kutash, Sheffield & Vaughn, 2006; McInerney & Hamilton, 2007). In this dissertation these studies have been disregarded on the premise that they targeted populations of practitioners who serve in special education programmes but not in the inclusive classrooms.

Therefore the included studies are delivered in the forms of reports (Conseil supérieur de l'éducation, 2006; Englert, Fries, Goodwin, Martin-Glenn, & Michael, 2004; Williams & Coles, 2003; McCaffrey & Hamilton, 2007; Department of Education, Training and Youth Affairs report (DETYA), 2000), conference papers (Green & Kivdahl, 1990; Wilson & Easton, 2003), edited books (Lafleur, 1995; McNamara, 2002), journal papers (Cousins and Walker, 2000; Demie, 2003; Everton, Galton & Pell, 2000; Leat, Lofthouse & Wilcock, 2006; Ratcliff et al., 2005; Simons et al., 2003; Wikeley, 1998; Williams & Coles, 2007; Parr & Timperley, 2008) and dissertations (Torrence, 2002; Meadows, 2008).

The majority of these studies are centred on school practitioners, whereas a few focus on structures and strategies providing support to individuals and schools. For instance, research by Leat, Lofthouse and Wilcock (2006) and Wilson and Easton (2003)

study the role of local educational authorities in bridging the gap between research and practice.

The available research mainly focuses on research-based information generated in academia. Only a few research projects study attitudes and utilization of school-based evaluations (Lafleur, 1995), school-based systematic inquiry (Cousins & Walker, 2000), school data (Torrence, 2002; Meadows, 2008) and value-added (Demie, 2003; McCaffrey & Hamilton, 2007) and student assessment (Parr & Timperley, 2008) data. Yet, some included both types (Zeuli & Tiezzi, 1993), but no comparison between general and local research-based information was made.

In the studies under analysis, the samples are mainly homogeneous, including single categories of school practitioners, whereas comparative studies, with the exception of Demie (2003), Parr and Timperley (2008) and Williams and Coles (2003, 2007), are practically nonexistent. For example, the research by Everton et al., (2000), which was primarily focused on studying teachers' use of research findings, presents comparative results for teachers and school principals, describing this sample as unintended. The main findings from the studies of teachers, administrators and school professionals are presented below.

Schoolteachers. Studies of schoolteachers describe teachers' attitudes towards research and their motivation to use it as positive (Green & Kivdahl, 1990; McCaffrey & Hamilton, 2007; Williams & Coles, 2003, 2007). In particular, teachers are willing to consider research in their practice (Ratcliff et al., 2005) and recognize the overall beneficial impact of research on teaching (McNamara, 2002), but only if research results are directly linked to practice. At the same time, teachers report little use of research

findings, whether it is produced in academia or locally in schools (Green & Kivdahl, 1990; Cousins & Walker, 2000; Lafleur, 1995; McNamara, 2002; Williams & Coles, 2003, 2007). When teachers report having used research, they do so to increase teaching effectiveness (McNamara, 2002), to reflect on their practices or to experiment (Conseil supérieur de l'éducation, 2006). Williams and Coles (2003; 2007) report that teachers are less confident about finding research and using it in practice than they are about dealing with information in general. However, teachers admit that teaching would improve considerably if they knew more about how to use research.

School administrators. Studies of school administrators show that they not only value research, but also use it in their practice (Biddle & Saha, 2002). School principals report having used data for a variety of instrumental purposes, that is, to establish performance criteria for students, monitor students' progress, set goals for their schools and articulate the progress of their schools (Englert et al., 2004; Meadows, 2008; Torrence, 2002). Englert and the team (2004) emphasize that to monitor progress and make appropriate decisions, multiple local sources of data should be used, such as attendance rates and standardized test scores, as well as community feedback and teacher observations. The majority of school principals in the research by Biddle and Saha (2002) reported having used research conceptually, that is, to learn from materials. In Wikeley's study (1998), senior school managers said they use research mostly symbolically, that is, to substantiate their own intuitive judgements.

School professionals. Studies of research utilization by professionals within a school context are sparse and have very little connection to student learning outcomes and school improvement. Given that such school professionals include school nurses,

psychologists, counselors and language pathologists, they operate according to the standards of their professions. The existing research is mainly concerned with the fidelity of program implementations validated by these professions (Adams & Barron, 2009). One of the available studies described school speech/language pathologists' attitudes towards research (Meline & Paradiso, 2003). The main findings included confidence in research, a belief that it is reliable and a willingness to keep up to date with the research literature.

Comparative studies. Studies making a distinction between groups of practitioners include the study by Everton et al. (2000) of an unintended sample including teachers, school principals and their deputies and the studies by Demie (2003) and Williams and Coles (2003, 2007) comparing head teachers and teachers. McCaffrey and Hamilton (2007) reported use of value-added assessment data separately for the sub-samples of school principals and teachers. Parr and Timperley (2008) explored whether the use of student achievement data is part of the professional canon or skill set for teachers, principals and literacy project leaders. The first three studies were performed in the U.K. context, whereas the fourth and the fifth were based in the U.S. and Australia respectively.

According to Everton et al. (2000), engagement in research caused all three groups to question their current opinions and led to improvements in their practice. However, deputy principals, as those who benefited the most from extended professional development opportunities to pursue their career advancement, scored the highest on the scale of interest in research. Teachers' interest in research was the lowest. This finding is echoed by the results reported by Williams and Coles (2007), where head teachers were

more positive in their attitudes towards research than their teachers were. In the study of head teachers and teachers (Demie, 2003), equally positive evaluations were given to the usefulness of the pre-analyzed multiple-year data to estimate the effects of their school and teachers on student learning. Conversely, McCaffrey and Hamilton (2007) reported that teachers viewed such value-added assessment data to be less useful than did principals. However, both groups reported engaging with the data at a relatively low level and for the same purpose – to identify low-performing students who need assistance. Parr and Timperley (2008) found that teachers, principals and literacy project leaders did not collect systematic student achievement data to evaluate the classroom intervention. These groups did not consider student achievement data to be an important source of information when making decisions about everyday practices – in this case, about efficaciousness of new materials. Moreover, the results suggested that the leadership style was facilitative and collegial rather than focused on the success of instruction.

The review of the empirical literature reveals that favourable attitudes towards research findings, positive motivation and willingness to consider research do not necessarily translate directly to the utilization of research for school improvement by all groups of school practitioners. Further review of the research produces a mosaic of factors that appear to affect practitioners' decisions to use research. A summary of these factors follows.

Factors of use. Factors affecting research utilization, as identified in the primary studies on research usage in education, may be grouped in a few ways, none of which can reflect their whole complexity. For instance, these influences may emerge at the practitioner's level and pertain to attitudes towards research as well as individual

capacity to use research. At the school level, these factors are deeply rooted in school culture and practices (ways of doing things) and may affect practitioners' ability to sustain openness to learn and stimulate or subdue their initiative to use research generated in academia or get involved in a local school-based research project.

In this study, the factors are grouped with a focus on the user of research-based information. Therefore, the factors are split between those emerging within an individual practitioner in a school or a broader system and those enabling communication among the levels.

Opinions about research-based information. Knowledge utilization in education is primarily contingent on the quality of the knowledge itself. However, the quality is judged or perceived by the user (Rogers, 1995). According to the existing evidence, educators value research if it is clear, timely, relevant to their reality and amenable to action (Cousins & Leithwood, 1993; Cordingley, 2004; Fullan, 1981; Hultman & Hőrberg, 1998; Louis, 1983; McCaffrey & Hamilton, 2007; Shkedi, 1998; McNamara, 2002; Ratcliff et al., 2005; Simons et al., 2003). The relevance and quality of locally produced information, such as school evaluations, predetermine their use by the school practitioner (Lafleur, 1995). Perception of the quality of research-based information also depends on the practitioner's job specifics. For example, school principals want to see relative advantages and compatibility of new ideas (Torrence, 2002). Classroom teachers emphasize that to be used, research should match their personal experience (Zeuli, 1994). It should be translatable into useful outcomes (Ratcliffe et al., 2005) and directly applicable in their teaching (Hultman & Hőrberg,

1998; Shkedi, 1998). It should also enhance teacher-pupil interaction and improve instruction methods (Everton et al., 2000).

Individual expertise. Individual capacity to use research-based information is attributable to individual practitioners (Rogers, 1995) and consists in a set of micro-characteristics, including awareness and skills for utilizing research to inform everyday practice and to produce research. Skills to formulate questions about problems encountered in practice and to find solutions by locating research-based information, appraising it critically, applying it in practice and conducting own research projects (Hultman & Hőrberg, 1998; Torrence 2002; Williams & Coles, 2003; Borg, 2003), the ability to choose between contradictory research data (McCaffrey & Hamilton, 2007), as well as the skills to collect student-related data and make inferences about them to inform decision-making (Parr & Timperley, 2008), have been reported to mould practitioners' attitudes towards research-based information and their utilization behaviours. These skills are associated with practitioners' self-efficacy (Abrami, Poulsen & Chambers, 2004; Torrance, 2002), prior involvement in research (Lafleur, 1995; Cousins & Walker, 2000), training (Conseil supérieur de l'éducation, 2006; McCaffrey & Hamilton, 2007; Parr & Timperley, 2008) and experience (Green & Kivdahl, 1990; Cousins & Walker, 2000), as well as individual willingness to innovate (Saha et al., 1995).

Awareness activities. These are methods and strategies that make practitioners aware of research-based information and may be described as communication channels between research and practice (Rogers, 1995). However, they pertain not only to the process of information dissemination, but also to the nature of relationships between the research producer and the potential user. Capitalizing on the

importance of the dialogue between educators and researchers, Louis (1996) insists that research products should be tailored to meet educators' needs and expertise, to fit their contexts and, in this way, to secure their use in practice. This dialogue ensures more personalized and contextualized interventions that make research user-friendly, enhancing the likelihood of its utilization (Fullan, 1981). Sustainability of these contacts guarantees the utilization of results produced by a common effort (Huberman, 1990). In this way, networks and partnerships between researchers and educators have been claimed to build trust between these communities as part of social capital and, consequently, to enhance situated transfer processes (Conseil supérieur de l'éducation report, 2006; DETYA report, 2000; Ratcliffe et al., 2005). King (1995), Wiliam (2002) and Simons et al. (2003) report that collaboration of practitioners and researchers as a joint effort to create locally relevant knowledge enabled practitioners to be full-fledged participants in the research process and owners of the research product. The formal system of intermediaries, such as linking agents who would span the boundaries between research and practice communities by assisting practitioners, has been reported as yet another strategy (Leat et al., 2006; Wilson & Easton, 2003). Infrastructures created on the basis of schools, departments of education and local educational authorities have been reported to encourage teachers to engage in and with research (Simon et al., 2003).

Organizational factors. This set of macro-factors refers to the user as an organization with its structure, culture, resources, procedures and incentive systems (Rogers, 1995) with which individual practitioners have to contend in their everyday practice. School setting (Fullan, 1981), school context (Hultman & Hőrberg, 1998) and institutional or professional culture (Cousins & Walker, 2000; Torrence, 2002; Ratcliffe

et al., 2005; Young, 2006) shape the capacity of schools to support the efforts of individual practitioners to search the existing research and to conduct research needed for their practices. Leadership and administrative style play a critical role in promoting organizational learning and change initiatives (Lafleur, 1995; Leat et al, 2006; Cousins & Walker, 2000; Torrence, 2002; Ratcliffe et al., 2005; Young, 2006), collaboration and collegial support (Landry et al., 2001; Simon et al., 2003). Embedded in a larger system, a school's push-pull activity is in turn affected by a number of external factors, including political argument, public opinions, financial support and the presence of lobbyists and support groups (Englert et al., 2004; Torrence, 2002; Wikeley, 1998).

The exercise undertaken in this section to summarize factors that may influence practitioners' decisions to use research-based information in their practices shows that the existing literature has explored possible influences on the process of research utilization. However, as Shulha and Cousins (1997) pinpoint, to foster the process of change efficiently, it is not enough to put together "extended shopping lists" of likely predictors. Instead, it is necessary to go beyond the mere exploration of variables and to test the relative weight of factors in their ability to predict use, that is, to know which factors are sufficient for the use of research-based information to occur.

A number of instruments have been developed to examine the processes of research use. However, very few of them have measurements of predictors of use of research-based information as their purpose. In addition, the quality of these instruments varies largely. An analysis of the existing scales follows.

Scales measuring research use. In the sparse pool of primary studies pertaining to the use of research knowledge, the ratio of quantitative studies is lower than

that of qualitative ones. Being primarily questionnaire-based, the available quantitative research on the use of research-based information considerably varies in purpose, design and quality. Appendix A summarizes the properties of the available survey instruments.

The instruments differ in the outcome measures they are designed to capture. The available scales examine a) behaviours of research use (Green & Kvidahl, 1990; Lafleur, 1995; Torrence, 2002; Conseil supérieur de l'éducation, 2005; Meadows, 2008; Williams & Coles, 2003, 2007; Hultman & Hörberg, 1998); and b) attitudes towards research (Saha et al., 1995; Cousins & Walker, 2000; Everton et al., 2000; McNamara, 2002). Factors affecting research use are oftentimes reported as by-products in the available studies, without being tested for their predictive force. In fact, only three studies were found to measure the predictors of research utilization behaviours. The study by Green and Kvidahl (1990) assesses the contribution of training in research methods and post-bachelor education in explaining teachers' self-reported use of research. The study by Torrence (2002) describing the role of data use by school principals in their instructional leadership and repeated by Meadows in 2008 in small and rural schools took a more systemic approach and looked at the impact of personal and school environment variables on the use of data.

Because of the growing popularity of the evidence-based approach in policy, decision making and educational accountability, a bulk of studies addresses the issues for the use of research knowledge, more precisely, school evaluation data for managerial and leadership purposes. Consequently principals and vice-principals are the target audience in the studies by Everton et al. (2000), Meadows (2008), Saha et al. (1995), Torrence (2002) and Williams and Coles (2003, 2007). The studies mainly pinpoint influences of

research on the individual practices of managers and overlook their role in cascading research knowledge to their staff and building their school's capacity to use research for school improvement.

The existing ambiguity in defining fundamental concepts such as "use" often results in poorly operationalized research variables, which does not allow for the conclusions and claims made in the studies. For example, Catri, Austin & Moore (2004) interpret "access to research" as an aspect of "use." "Considering research" for Everton et al. (2000) means "research impact on practice," whereas "involvement in research" signifies a "type of use." Haltman and Hörberg (1998) and Williams and Coles (2003) claim to have examined the utilization of research by practitioners, although they did not ask their respondents any questions about the use of research behaviours.

At the same time, lack of satisfactory psychometric properties and tests on unrepresentative samples are the main points of criticism in the existing questionnaires. For instance, many survey studies do not provide any internal consistency reliability information about the scales used to address the issues of utilization (Lafleur, 1995; Williams & Coles, 2003; Haltman & Hörberg, 1998; Saha et al., 1995; Conseil supérieur de l'éducation, 2005). Others, such as Everton, Galton and Pell (2000), report only reliability coefficients for parts of the instrument. Tests for construct validity have not been reported either (Lafleur, 1995; Williams & Coles, 2003; Green & Kivdahl, 1990; Conseil supérieur de l'éducation, 2005). Nor do the sampling strategies allow for the conclusions or claims that were made. For example, an imbalanced minuscule sample (Lafleur, 1995; Saha et al., 1995), misrepresentation of novice and experienced teachers

(Conseil supérieur de l'éducation, 2005) and of teachers and administrators (Everton et al., 2000) and convenience sample for randomized sample (Torrence, 2002) restrict the generalizability of findings.

Lack of replication does not add reliability and durability to the existing measurement scales, contrary to the questionnaires developed to measure research utilization in health care. For instance, the scale measuring barriers to research utilization in nursing by Funk et al. (1991) was repeated by at least seven studies internationally. The rare exception was the partial utilization of Green and Kivdahl's (1990) scale by Cousins and Walker (2000) and the replication of the Torrence questionnaire (2002) by Meadows (2008).

Therefore, there is a need for a study measuring research utilization behaviours by various groups of school practitioners and to identify the unique and combined contribution of factors explaining use of research-based information and its dimensions. Besides, the instrument used for measurement needs to produce indices of reliability, validity and predictive ability that satisfy existing psychometric standards.

Summary

The chapter has explored the issue of research knowledge utilization as outlined in the existing conceptual and empirical literature. It is obvious from the review that, having originated from disciplines other than education, the term "research use" possesses a significant degree of ambiguity in the way it defines fundamental concepts and processes. Consequently, there is not much clarity in what type of "research use" is expected for school improvement. Nevertheless, what is clear is that research use forms a

complex construct requiring consideration of multiple dimensions to form a comprehensive picture.

In this study, particular emphasis is placed on identifying a set of variables affecting utilization of research-based information. As evidenced in this review, there were a few challenges to the exercise. Firstly, pertaining to the level of individual practitioner, school and the broader system, these factors vary considerably among the available studies, which are sparse. Secondly, in one respect or another, the few instruments that have been developed to collect the presented data are limited in their capacity to examine the process of the use of research to inform educational practice. Lastly, studies comparing school practitioners of various ranks in their use of educational research are almost non-existent.

Therefore, to determine which factors are sufficient for the utilization of research-based information to occur in school practices, there is a need to conduct a study of different groups of school practitioners, using an instrument with satisfactory psychometric qualities that is designed to identify the multidimensionality of use.

The description of the methodological approach taken to determine these influences, as well as the presentation of the results, their interpretation and implication for practice and future research, are provided in the following chapters.

Chapter 3

Methods

This project is based on data collected on the use of research-based information by school practitioners in their everyday practice. Its primary goal is to understand the variables associated with practitioners' use of research and to capture the relationship between these variables and practitioners' use of research-based information. Two major questions guided this inquiry:

1. How do groups of school practitioners in Canada, such as teachers, principals and professionals, vary in their use of research as a driving force for school improvement?
2. What are the predictors of use of research by school practitioners across Canada?

As a secondary goal, the study aims to broaden the scope and generalizability of the behaviour and attitude instrument specifically designed and developed to measure use of research by secondary school teachers, principals and professionals in Quebec on a broader pan-Canadian sample of school practitioners. Therefore, this research also attempts to answer the question of whether the psychometric qualities of the questionnaire will change if

1. primary school practitioners are added to the sample; and

2. the sample includes school practitioners from different jurisdictions in Canada.

This chapter outlines the methods employed to document the use of research and dimensions of this use by different groups of school practitioners and to cross-validate the instrument. Specifically, the first section discusses the advantages and disadvantages of the research design selected for this study. Section two focuses on the sample selection strategy and its limitations. Section three reports the steps of the study implementation, including the design and development of the data collection instrument and its administration online. Strategies used to recruit participants and the resulting response rate dynamics are described in section four. Section five overviews the statistical strategies chosen and analyzes the data to answer the research questions of this study. Section six evaluates the quality of the collected data and the techniques used to optimize the data for statistical analyses.

Research Design

The method selected for gathering information providing responses to the above questions was a cross-sectional online survey. Traditionally, survey research has been recognized for its potential to produce results that are more representative of the population than any other data collection techniques (e.g., interviews and observations), and it is especially effective with large populations. In this vein, a cross-sectional survey makes it possible to determine, with a certain level of accuracy, information about different cohorts of large populations at a specific moment in time. The population of school practitioners across Canada varies because its members have not been exposed to identical experience. The difference is shaped by variations in the provincial educational

ecology, along with occupational dissimilarities between teachers, school administrators and professionals. The cross-sectional design allows for comparison of the three groups of school practitioners (school administrators, teachers and professionals) across Canadian provinces and territories in terms of their demographic features, behaviours and attitudes towards research-based information.

Administering a survey using a Web-based technology makes it possible to conduct a large-scale study of the geographically scattered population, to decrease research costs and to distribute the questionnaire and collect responses quickly and efficiently (Andrews, Nonnecke & Preece, 2003). Additionally, a survey-hosting system has the advantage of transferring responses into a database in almost no time, preventing transcription errors and survey alterations.

However, an online survey's potential to estimate the distribution of characteristics in a population may be threatened by a number of well-documented problems inherent to the design itself and the delivery medium (Dillman, 2000). First and foremost, as a descriptive rather than explanatory method, it is unable to offer insight into cause-and-effect relationships between phenomena of interest. Furthermore, a number of threats to external validity should be considered: 1) sampling error resulting from the attempt to survey only some and not all the units in the entire population; 2) coverage error occurring when the list from which the sample is drawn does not include all elements of the population; 3) measurement error resulting from the poor wording of questions or from questions and answer choices being presented in such a way that inaccurate or uninterpretable answers are obtained; and 4) nonresponse error occurring when a significant number of people in the sample do not respond to the questionnaire

and have different characteristics from those who do respond. Finally, since data collection relies on respondents' self-reports, it depends on their motivation, memory, ability and willingness to respond. The subjects may not be aware of or may have forgotten their reasons for any given action (Schwartz, 1999). They may not be motivated to give accurate answers to the questions or may provide responses that make them look better. Because research use might be linked to school improvement, asking questions to school practitioners about the use of research may also bias their responses. Practitioners may be unwilling to admit to not having used research in their practices. However, social desirability pressure is much lower in surveys than when responses are made directly to the interviewer.

Computer technology involvement in the process of questionnaire administration may cause additional problems and aggravate existing ones. The Web-based mode may increase sampling error by imposing biases, such as exclusion bias when digital divide reduces the target population to those who can use computers and are connected to the Internet, and self-selection bias when those who are highly motivated to respond are overrepresented and individuals who are indifferent are less likely to respond. Although few substantive differences between Web-based and paper-and-pencil surveys have been found, those differences often reflect changes in the design and functionality of the instrument. Most of these changes involve modification of the layout, which may make it harder or easier to complete the questions.

Sections describing the strategies and techniques employed to select the sample of the study population, to collect the data and to ensure the privacy and confidentiality of the repondents follow.

Population and Sampling Strategy

Selecting the sample. To answer the research questions, responses were needed from the main categories of school practitioners, namely school administrators, teachers and professionals from Canada's ten provinces and three territories. According to the 2006 Census data from Statistics Canada (2006), the target population included 29,020 principals and administrators, 422,770 teachers and 16,605 educational professionals working in secondary and elementary schools. To reach these vast populations, list-based high-coverage sampling (Couper, 2000) was chosen as the primary sampling technique. According to this strategy, list-based samples of high-coverage populations start with a frame or list of those with Web access. Since there is a strong tendency for unionization of professionals in Canada, it was assumed that provincial trade unions and federations of school practitioners might help with accessing the target population. In the recent 2008 analysis on Perspectives on Labour and Income, Statistics Canada reported that 86% of practitioners in primary and secondary education are union members. Serving the interests of school practitioners, unions are the primary gatekeepers to the population working at all school levels in the provinces and territories of Canada. Therefore, it was decided that federal professional associations, such as the Canadian Teachers' Federation, its members and affiliates, the Canadian Association of Principals, the Canadian Association of School Board Administrators, as well as their provincial analogues (see Appendix B for the full list of associations contacted in this study) would be asked to assist with this research. Such non-profit organizations as the Canadian Education Association and LearnQuebec, which also have educational

practitioners of various ranks among their members and subscribers, were on the list of contacts. If the professional union could not provide such assistance, provincial colleges of teachers (where available) were contacted as a supplementary strategy to obtain access to teachers.

To complement the top-down method, a grassroots strategy was also developed to recruit more participants. In this case, 105 school districts were randomly selected out of 376 school districts/school boards proportionally to the number of school districts in each province (KI-ES-KI Handbook – Directory of Key Contacts in Canadian Education). The number of selected school districts exceeds 100 because the share of some provinces/territories, such as Yukon, is lower than one per cent; thus, to represent it, one school district was selected. Although the majority of provinces are English-speaking, an attempt was made to include districts where French-speaking schools are located. A pool of schools from each of the selected school districts was created. Numbers representing the proportions of school districts and schools by province can be found in Appendix C.

Determining the sample size. The ideal sample would be representative of the Canadian population of educators and proportional to the size of each province and territory, large and randomly selected without known biases. For example, the total number of Ontario educators is 190,280 or 40.6% of all Canadian school practitioners. Similarly, the total number of administrators is 29,020 or 6.3% of all Canadian educators. The complete breakdown between provinces, territories and occupational categories is presented in Table 1 below.

Table 1

Distribution of three groups of practitioners across Canadian jurisdictions according to 2006 Census data

	Principals and administrators	***Teachers****	***Professionals*****	***School practitioners***
Alberta	3710	39275	1620	44605
British Columbia	4150	48595	3095	55840
Manitoba	1120	17300	800	19220
New Brunswick	620	9185	405	10210
Newfoundland & Labrador	435	6595	370	7400
Northwest Territories	95	760	45	900
Nova Scotia	759	11770	520	13049
Nunavut	65	650	40	755
Ontario	10890	174180	5210	190280
Prince Edward Island	145	1640	105	1890
Quebec	5510	97560	3805	106875
Saskatchewan	1420	14740	555	16715
Yukon	50	530	25	605
Total	29020	422770	16605	468395

* 2006 Census data
** According to the National Occupational Classification, the category includes superintendents, principals, vice-principals and directors.
*** According to the National Occupational Classification, the category includes school teachers and school librarians.
**** According to the National Occupational Classification, the category includes academic, educational, guidance, school and student counsellors. Statistics for such categories as school psychologist, nurse, language pathologist and social worker are unavailable, as they are lumped with the broader professional categories going beyond the school context.

However, as stated above, the sampling procedure was not probabilistic, making the relationship between the population and those sampled problematic: the sampling process did not give each person selected a known probability of selection; there were no statistical grounds to conclude that a particular sample size would be representative of the sampled population. According to Hill (1998), a non-probabilistic sample of about 10% of the parent population, including up to 500 participants, is sufficient. In light of Hill's

recommendation as well as the planned data analysis strategies (multivariate analyses, including exploratory factor analysis, multiple regression and group comparison), the lowest limit for the target sample was set to 2,000 observations. Although this sample size is not large enough in absolute terms, it is sufficient to yield robust results without great risk of Type II error due to low statistical power.

Strategy limitations. The chosen approach to sample selection has a number of serious limitations that may compromise the external validity of the study, that is, the extent to which the information collected from surveying a particular group of individuals can be generalized to a larger population under study. Specifically, coverage error and self-selection threaten the inference to the general populations.

The issue of coverage is twofold. First, the digital divide phenomenon accounts for the fact that people participating in online surveys might be different from the general population. This refers to unequal access by school practitioners to information and communications technology, and the unequal acquisition of related skills. However, as reported by Statistics Canada, 97% of Canadian schools were connected to the Internet by 2004.

Second, a sampling frame of online users cannot be identified with precision. The study was dependent on whether the membership of the contacted associations and school staff is representative of the population of school practitioners in Canada, and whether the groups of practitioners who responded by completing the online questionnaire were representative of the union membership and school staff, Although the high unionization rate indicates that the Canadian school practitioner population is well represented by

membership in professional federations, 65,576 practitioners are left out from the coverage.

Since the study relied completely on the self-selection of participants, and there was no direct contact with the target sample, there was no control over the data bias. No phone surveys or school visits were conducted to collect comparison data and explore whether, where and to what extent the Web survey respondents differed from the population of interest. Nor was an analysis of non-response performed. For example, there was concern that Web respondents who did not like the subject matter of the questionnaire would not complete it. Also, it was possible that respondents with extremely positive or negative views might complete the survey with greater frequency than those who were neutral.

Therefore, this study did not allow generalization beyond the population of school practitioners who, at the moment of the study, were members of the professional unions, had a strong rapport with their professional association (responsive to their requests), consulted their union Web sites on a regular basis, subscribed to and read a newsletter either in electronic or paper form, took an interest in the survey topic and were willing to self-report about their attitudes and behaviours.

Study Implementation Procedures

The steps taken to implement this study included planning the project, finding the online system to deliver the questionnaire to the study population, organizing the layout of the questionnaire, administering the survey and collecting the data. Although development and validation of the survey instrument occurred at the stages preceding this

research, the information describing these steps is crucial to this study and is briefly reported in the following section.

Planning the study. Planning this survey project included preparing the grant proposal, "Measuring the Impact of Research on Educational Practices: Validation Study," submitted to the SSHRC Presidential Fund Initiative and getting approval from the Concordia University Human Research Ethics Committee when funding was granted. The next step was to present the proposal for this study to the Dissertation Committee and the Department of Education and to gain their approval to conduct this research. The Canadian Council on Learning's ECHO online assessment tool, which was at the beta-testing stage, was chosen as a medium to host the questionnaire online. The support of school practitioners' unions and associations was then sought, and the pool of randomly selected primary and secondary schools all over Canada was prepared.

Instrument development. This study uses the questionnaire specifically developed as a comparison tool for use in a broad context with a variety of occupational categories. *Questionnaire about the Use of Research-based Information* (QURBI), (Abrami, Dagenais, Janosz, Bernard, Lysenko, 2007) was created as an attitude and self-reporting behavioural measure to collect data on utilization of research-based information by educational practitioners. Measuring research utilization is about identifying its influence on the array of human activity that manifests itself as changes in an individual's behaviours, understanding and attitudes towards practical issues. In this way, the instrument attempts to measure the following three types of utilization: instrumental, conceptual and symbolic. Since the process by which research is used in practice is nonlinear and related to and affected by the interconnected contexts within which

research findings are presented to and appropriated by practitioners, QURBI attempts to determine the complex effects of individual expertise in accessing, appraising and using research, opinions that practitioners attach to research findings, activities keeping practitioners aware of research findings and organizational factors, including culture, available resources, and external influences on the individual practices.

The process of questionnaire design, development, refinement and validation was an iterative process with co-running, overlapping and recurring activities, as presented in the Figure 1 below.

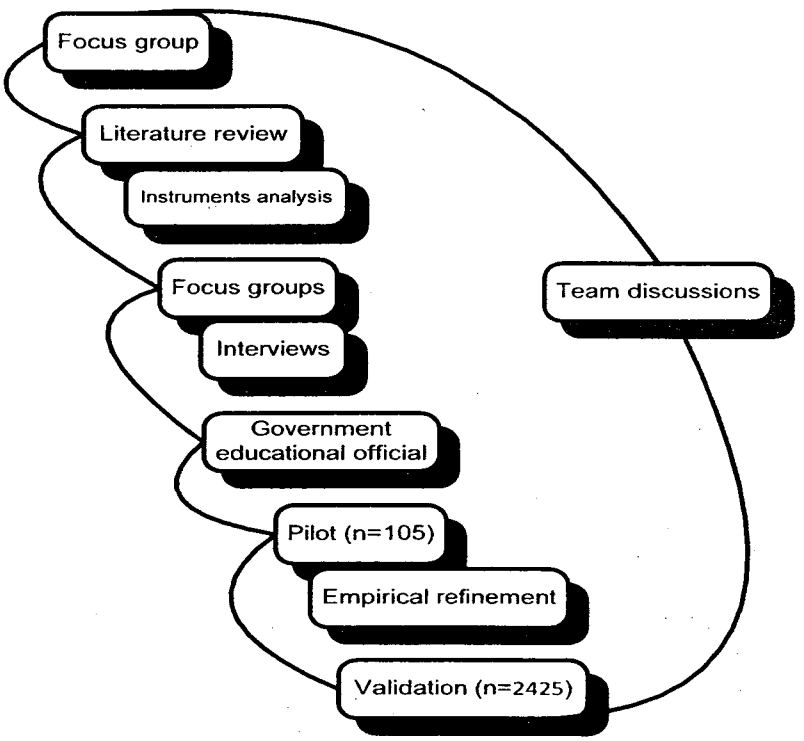

Figure 1. Stages of QURBI development.

An extensive literature review where the analysis of the existing scales was performed provided the basis for the questionnaire development. Four focus groups with teachers and professionals and three interviews with school principals and the Ministry expert input contributed to the iterative development of the questionnaire. In 2006, a pilot study was performed to field-test the instrument. It involved 105 practitioners and showed the questionnaire's high internal consistency (Cronbach's alpha = 0.90) and the correspondence between its latent structure and the conceptual framework upon which the questionnaire was built. The instrument's ability to predict research use was rather modest; the four-factor model explained only 16% of the variance. Although the contribution of all four factors was statistically significant, opinions about research use turned out to be the strongest predictor of use, accounting for about 9% of use.

On the basis of the empirical data, the questionnaire was further refined and reduced to 43 items. In spring 2007, the full-fledged validation study of QURBI was conducted in the province of Quebec's secondary schools. The data were collected under the umbrella of a large long-term evaluation of a government initiative (2002–2009) aimed at increasing school success among adolescents from disadvantaged communities. Besides developing as a learning organization, each school in this project was engaged in a rigorous and systematic process targeting, among other things, the development of the success plan, including the action strategy grounded in "best practices" and research findings.

The responses of 2,425 school practitioners (administrators, teachers and professionals) were analyzed separately to validate the instrument for English- and

French-speaking practitioners. The instrument demonstrated the stability of psychometric properties for both languages (Cronbach's alpha 0.92). Following the exploratory factor analysis, the four-factor structure with comparable percentage of variance explained was nearly identical for both sub-samples (63% for French speakers and 63.4% for English speakers). The obtained latent factors pertained to opinions about research-based information and activities that may raise practitioners' awareness about research, professional expertise to use research in everyday practice and organizational factors. The ability of these four factors to predict the use of research-based information by school practitioners was found to be modest ($R^2 = 0.19$), although statistically significant.

Responses of 459 secondary school practitioners unused in the validation study were used in this study to compare the psychometric qualities of the instrument on the broader sample.

QURBI layout. QURBI was used to study the use of research-based information by different groups of school practitioners. The seven sections of the survey are constructed as multiple-choice questions. The introductory section is a mix of demographic and research-utilization-related biographic items, including 16 questions pertaining to: a) the individual practitioner (gender, age, highest received degree, subject area, years of experience, grade level and membership in a professional association); b) experience with research (items asking about coursework in Research Methods and participation in research projects were borrowed from Green & Kivdahl, 1990; Cousins & Walker, 2000); and c) the school (size, language of teaching, socio-geographical location and province or territory).

Section One (10 items) asks practitioners about how frequently in the past year they used research-based information from scholarly documents; professional publications; evaluation reports on their organizations; the Internet (Web sites); multimedia (videos and DVDs); mass media (TV, radio, newspapers, magazines); pre-service training; university courses; in-service training; workshops and professional conferences; and experts and resource people. It is measured on a four-point scale from "never" to "5 or more times."

Section Two (7 items) asks participants about the frequency with which they used research-based information for specific ends: conceptually, instrumentally or symbolically. It is measured on a four-point scale from "never" to "always."

Sections Three through Six (26 items) pertain to the predictors of use of research-based information and are titled as follows: 3. Opinions about research-based information; 4. Awareness activities; 5. Individual expertise; and 6. Organizational factors. They are measured on a five-point Likert scale ("strongly disagree" (1) to "strongly agree" (5)) and referred to as QURBI factors.

In addition, each of the last six sections is followed by an open-ended question asking school practitioners to add and comment on the sources of research-based information, types of use and factors influencing their use of research-based information in everyday practice.

Appendix C contains a copy of the questionnaire originally developed in a paper-and-pencil format.

QURBI online. The Canadian Council on Learning's ECHO online assessment and research tool was used to host the questionnaire. Since the system is built on a

hierarchical database, a theoretical framework of the questionnaire had to be developed to determine the content entering the system. This was structured as a hierarchy classifying the questionnaire content into three-level domains. For instance, demographic content of the questionnaire was defined at the first level as either personal or organizational; at the second level as pertaining to an individual professional or school environment; and at the third level as referring to education, experience, networks and such school characteristics as size and geographic and linguistic features.

The questionnaire items in both languages were anchored to the framework and then assembled into assessments that are sections in a paper-and-pencil questionnaire, and were finally released as a bilingual survey. The choice of language was available via the language selection function. The survey release also included the questionnaire instruction page. The system allowed for both selected (multiple choice and scales) and extended (fill-in-the-blank, short answer and essay) responses that formed the basis of the questionnaire. The system also enabled the creation of algorithms to develop paths specific to this survey: for example, "if the answer to item 4 is no, then skip item 5 and go to item 6." Analytic functions for calibrating items and providing statistical evidence, such as frequencies, factor analysis, regression and group comparison, were integrated into the ECHO Calculator as automated routines. The database of responses was downloadable to EXCEL format and could then be imported into a variety of independent statistical software applications such as SPSS for further analysis.

A number of features added user-friendliness to the system interface. Automated conversion to PDF was a function for obtaining a paper-and-pencil version of the questionnaire. Other functionalities included a progress bar showing respondents their

advancement through the survey; an assessment summary for reviewing items and flagging incomplete items; the assignment of a participation code enabling respondents to log back onto the survey at the page where they left off and to flag items they were unsure how to answer so that they could review them later. The complete description of the system functionalities is provided in Appendix D.

Providing respondents with privacy and confidentiality. One of the reasons the ECHO system was chosen as a delivery medium for this study was to address the issue of privacy and confidentiality. First, the Canadian Council on Learning provided a credible domain. Second, the system ensured absolute anonymity for respondents. The integrated functionalities did not require logging IP addresses, and users were not asked to provide any information that would enable them to be identified. Thus, responses could not be traced back to individuals. Answers to the questions in the demographic section of the survey were not sufficient to identify individual respondents.

Since implied informed consent was used in this study, physical consent forms were not sent to participants to be signed. The survey's welcome page (Appendix E) contained a message informing participants about the purpose of the study, its risks and benefits, as well as the conditions of participation, that is, respondents' rights related to the research and researchers' responsibilities. Thus, voluntary completion of the online questionnaire implied the respondents' consent to their participation in the project and to the publication of project results. The letter of invitation to participate in the project (Appendix F), as well as the introductory message of the online questionnaire, informed participants about their freedom to discontinue at any time. Respondents were asked to

record their session number assigned by the system as the only means to withdraw their responses from the datafile if they wished to do so.

Administering QURBI. The English and French versions of the questionnaire were available online for all groups of school practitioners in September 2008. In order to inform the target audience about the questionnaire, the leaders of provincial professional associations were asked to send/forward the email invitation containing a URL link to the questionnaire to their full lists of members, including cohorts targeted by this study. Posting an invitation to participate in the study in the association newsletter was an additional option for notifying participants about the survey and engaging them with it. In cases where a provincial teachers' association decided not to participate in the survey, the schools were contacted for assistance. School principals or their deputies were asked by telephone and email to forward the invitation with the URL link to practitioners in their schools.

The contact people used mailing lists to distribute the questionnaires to practitioners. Participants who wanted to fill out the questionnaires by hand could download printable PDF copies in both languages from the Web site. The respondents were also provided with the URL link to free downloadable Adobe Reader software. The mailing address to return completed questionnaires was provided in an invitation letter.

As an incentive for participation, associations and schools were offered brief report-snapshots describing how research was used by their practitioners, what research activities were most efficient and what their teachers needed to utilize research in their everyday school practice.

Recruitment and Response

Recruiting participants. As the previous sections suggest, the choice of medium to communicate the message about the survey was left at the discretion of the professional organizations. A variety of approaches was selected. Nevertheless, the majority of professional organizations opted for the passive approach for disseminating information by posting banners on their Web sites asking their members to complete the survey. Clicking on this banner allowed potential respondents to read the invitation containing the active URL address for the survey. In other cases, the full text of the invitation was placed on the Web page with an active link to the questionnaire.

Sometimes, more active recruitment strategies were employed. Invitations with an active link to the survey were published in electronic professional newsletters or bulletins and sent to those on the subscription list. On one occasion only, information about the questionnaire was forwarded to practitioner-subscribers through the RSS feed, allowing them to receive updates from their favourite Web sites. On another occasion, email invitations were sent to the list of teachers who had given prior consent to participate in the research conducted by the organization.

Advertising the survey in paper publications was not a rare occurrence. In communicating with their members, a few professional associations still rely solely on traditional, not technologically enhanced media. One association used this method as a complement to other means. In these cases the distance separating participants from the survey could not be overcome by a few clicks of the mouse.

Strategies used by school principals to recruit practitioners in their schools for this study are not well known. When contacted the first time, they were asked to forward the electronic invitation with the active link to the survey to their practitioners. It is difficult to trace how word about the study was spread to the schools, if at all. The reluctance of school principals is illustrated by the comment made by one of them in a follow-up telephone conversation: "I filled it (the questionnaire) out and forwarded the link to my teachers, but I am not going to push this . . . that's too much . . . they have enough on their plates."

Appendix G illustrates the various forms of assistance, including Web sites screenshots, samples of newsletters and messages, used to connect the online survey and educators.

Data collection and response chronology. The temporal rate of response and its link with survey promotion provide the key to understanding the data collection process. As mentioned before, a mix of approaches was used to invite school practitioners to participate in this study: a) unions and professional associations were asked for their assistance in accessing the population; and b) school principals of randomly selected schools were contacted for their help.

In early September 2008 formal requests for assistance were sent to the official email addresses of the associations' top administrators. After a week, telephone calls were made to follow up on them. In one occasion, it took up to 10 calls and a month to get the letter of request to the attention of the union president. On average, because the decision of the Executive Boards was required, the lag time was three to six weeks to find out whether the union or federation would provide their assistance with this study and

what strategy they would employ. The choice of strategy to promote the questionnaire to its members was at the union's discretion and depended on the organizational routine and the channels the association used to communicate with its members: emails, Web sites, electronic bulletins, RSS feeds or traditional print, solely or in combination. The researcher was informed about the association's decision either in a formal letter sent by regular mail, electronically or in a telephone call. The decision was negative in one case only, and assistance was requested from the college of teachers. When the association decided to support the request, there were other major delays, such as the invitation waiting to be included in the release of the professional newsletter. The newsletters were sent through the list of subscribers (for instance, Canadian Education Association). When the decision was made to post the invitation on the association Web site (for example, Saskatchewan Teachers' Federation, the Fédération des syndicats de l'enseignement), the delay was minimal (one or two days).

The majority of associations opted for passive promotion (publishing the invitation and the survey link on their Web sites and in their newsletters), while only one association sent email invitations to its members. If the response rate was low following the release of information about the survey by a professional union, an alternative strategy was used: telephone calls were made to schools and, upon agreement, the promotion packages were sent electronically. Further delays occurred at this stage. In a few cases, principals referred researchers to their school districts for permission to conduct research in a given school, and the package containing the project description and the summary protocol form reviewed and approved by the University Ethics Committee was sent to the district. After permission was obtained, the schools were

contacted again and the e-invitations were first sent to the school principals and only afterwards forwarded to the school practitioners. Even when permission was granted, some principals refused to partcipate. If accepted, the follow-up calls were made in two days. Overall, 135 schools were contacted. It is difficult to determine the efficiency of the approach used in in this study in the period between late September and late December 2008. However, examination of the dynamics of the responses showed that the top-down approach yeilded significantly more participants than the second approach based on one-school contact. The figure below indicates that the response rate continued to grow steadily and achieved its influx from mid-October to early November, when 73.8% of responses arrived. Considering the fact that the peak of the associations' promotion activities occurred at this time, their link to the response rate dynamics is evident.

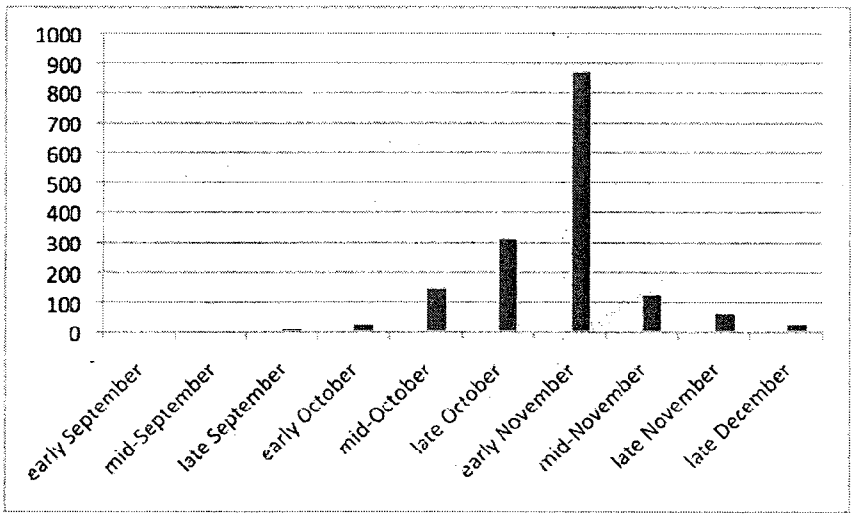

Figure 2. Response rate chronology.

The chart does not suggest any connection between the time the practitioners were aware of the survey's existence and the response rate implying that no informal promotion was occurring among the school practitioners. In this project, a response spike occurred after intensive promotion, and responses from a particular province continued for three to five days. For example, 190 practitioners responded to the French version of the survey on October 20, 21and 22, whereas 584 practitioners responded to the English version on November 5, 6 and 7. This generally seems to be in agreement with Smith (1997), who observed that the majority of responses come within 48 hours after the survey has been brought to the attention of the target audience. Since the survey did not include a question on how the respondents found information about the survey, it is not clear whether receiving invitations from multiple sources (for example, from the college of teachers or the Canadian Education Association monthly newsletter) encouraged practitioners' participation in the survey.

Response rate. The sample for this study included school practitioners across Canada who were contacted through federal and provincial professional unions, teacher colleges, non-profit educational organizations and randomly chosen schools, and who self-selected to participate in the online survey. Overall, 1,611 respondents were registered by the system, including practitioners who responded to at least one survey question; 1,164 individuals filled out the English version of the survey and 447 answered the French version.

Estimating the response rate in this study was quite a challenging task as the size of the target population was ambiguous because of coverage and membership. The researchers did not have direct contact with the broad population of school practitioners

across Canada. Firstly, as described earlier, access to the population was dependent on the co-operation of federal and provincial labour unions and organizations, which are the gatekeepers to the school practitioner population. When schools were contacted, school principals were the mediators. Secondly, the means chosen by these mediators to inform practitioners about the study mattered. Passive solicitation through Web sites, electronic or even paper publications was less likely to elicit responses than personal invitations sent to practitioners.

Overlapping membership by practitioners in a number of organizations, such as the Canadian Association of Principals (CAP), the Quebec Provincial Association of Teachers (QPAT) and the Canadian Education Association (CEA), and their subscription to the Canadian Council on Learning e-bulletin also made estimation difficult. For example, after the union in a province refused to help, the provincial college of teachers, having been modestly compensated to cover the dissemination expenses, agreed to send invitations to its mailing list of about 3,000 teachers who had consented to participate in research conducted by the college. However, the number of questionnaires returned only somewhat relates to this number because practitioners might have received communications from some other organizations at the same time.

It is obvious that the return of 1,611 responses was minuscule (< 1%) given the potential maximum response of the unionized population of school practitioners across Canada (~400,000 members). However, in the surveys of the general population, where no master list of coordinates was at the researcher's disposal and the study was promoted via Web sites, which is comparable to this study, the response rate may be as low as 1 – 2%, and for banner-advertised surveys, around 0.5% (Couper, 2001). The low rate of

response may have been a function of lack of interest or the length and complexity of the survey. Since the average response time was about 15 minutes, there is a concern that disinterest may have played a meaningful role in the low rate of reply.

In regard to the targeted 2,000 responses predetermined by statistical appropriateness for multivariate analyses, the return was 80.5%. A summary of the proportional representativeness of responses obtained from every province and every occupational category and that of the school practitioner population that might potentially have been solicited to participate in the study is presented below in Table 2.

Table 2

Comparison of provincial proportions in the population of school practitioners versus respondents to the questionnaire

	Population of school practitioners (n = 468,395)	***Respondents (n = 1,611)***
Alberta	9.5%	3.6%
British Columbia	11.9%	9.4%
Manitoba	4.1%	1.2%
New Brunswick	2.1%	10.9%
Newfoundland & Labrador	1.6%	0.87%
Northwest Territories	0.2%	0.06%
Nova Scotia	2.8%	1.36%
Nunavut	0.16%	0.12%
Ontario	40.6%	39.9%
Prince Edward Island	0.4%	0.9%
Quebec	22.8%	4.3%
Saskatchewan	3.5%	1.5%
Yukon	0.13%	0.12%
Unknown		25.6%
School administrators	6.2%	6.9%
Teachers	90.2%	67.8%
Professionals	3.6%	8.7%
Unknown		16.6%

With regard to proportional representativeness of the sample in relation to the population of school practitioners, the collected data are quite unbalanced and contain unequal proportions of respondents adjusted for provincial and territorial size, and unequal proportions adjusted for type of professional size. As Table 2 shows, with the exception of New Brunswick, all provinces and territories were underrepresented in the sample to varying degrees. Quebec population of school practitioners was the least represented in the sample.

Data Analysis Strategies

To meet the research objectives targeting identification of the predictors of use of research-based information as well as verification of the instrument on a broader sample of school practitioners beyond one province context, a combination of descriptive, comparative and associational statistical methods were used to analyze the collected data. Appropriate statistical procedures were selected on the basis of guidelines provided and discussed by various authors (Pedhazur, 1997; Reise, Waller & Comrey, 2000, Tabachnik & Fidel, 2007; Welkenhuysen-Gybels & van de Vijver, 2001; Zumbo, Sireci & Hambleton, 2003). The SPSS for Windows Statistical Package (version 15) was used to complete the statistical procedures. The content analysis of practitioners' comments to open-ended questions was performed through NVivo 8 (trial version with full functionalities).

A particular set of statistical procedures was predetermined by the level of measurement employed in this study. Nominal and ordinal scales were used as measures for the collection of biographic and demographic data. A four-point frequency scale was

used to measure two sets of dependent variables: 1) the use of research-based information; and 2) dimensions of use as reported by school practitioners. A five-point Likert scale measured independent variables: the attitudes of school practitioners towards research-based information, activities that may raise their awareness about research, skills necessary to use research-based information in practice, as well as factors emerging at the level of primary and secondary school.

Primary analysis: Analyzing the use of research-based information and its predictors.

Descriptive analyses. To describe the basic features of the data collected in this study, descriptive statistics were used. They provide summaries about the sample and the measures. Percentages and frequencies were calculated using biographic, demographic data. Measures of central tendency helped to examine QURBI data to describe how frequently school practitioners use research results from different sources, and how they use these sources to make decisions about pedagogical practices revealed the following results and their attitudes towards the factors affecting use of research-based information in school practice.

Mean group difference analyses. To test the three sub-samples for the differences in their mean scores on the use of research-based information sources and three types of use, one-way between-subjects ANOVA was used as a main statistical procedure. Because the group sizes were discrepant, when omnibus F was found statistically significant, three independent sample t-tests were run because the procedure allows for alteration if the assumption of homogeneity of variance between the sub-

samples was violated. Levene's test determines whether the group variances are approximately equal or whether an adjustment is needed for unequal group variances.

Effect size measures as a function of differences in group means were intended to show the magnitude of difference between the sub-samples. Cohen's *d* as the most common effect size measures for t-tests was calculated using the following formula: $d = \overline{Y_1} - \overline{Y_2} / SD_{pooled}$ where $SD_{pooled} = \sqrt{((n_1 - 1)SD_1^2 + (n_2 - 1)SD_2^2) / (n_1 - 1) + (n_2 - 1)}$. The values 0.2, 0.5 and 0.8 are used as the limits of a small, medium and large effect size for Cohen's *d* in regard to the degree of overlap between the sampling distributions of means. When $d = 0.20$, the degree of overlap between the distributions is 85%; when $d = 0.50$, the degree of overlap is 67%, and when $d = 0.80$, the overlap is only 53%.

Factor analysis. Exploratory factor analysis was used for a number of purposes. The first was to summarize patterns of correlations among the observed variables and thus reduce their large number to factors. The second was to detect the underlying structure of the questionnaire items by determining whether each item contributed to the factor with which it was associated on the questionnaire.

Varimax rotation was performed to create a set of factors to be treated as uncorrelated variables as a procedure to handle multicollinearity inappropriate for a statistical strategy such as multiple regression. The Kaiser rule, dropping out the least important factors (eigenvalues less than 1.0), was combined with the elbow selection on the scree plot. In an attempt to explain variance with as few variables as possible (parsimonious approach), the criterion was selected to be as low as 55%.

There is no rule to follow about the cut-off point for the loading of a variable to become a defining part of the factor. The meaning of the factor loading magnitudes varies

by research context. For example, for a Likert scale, loading of 0.6 is considered high. In this study, the formula $5.152/\sqrt{n-2}$ suggested by Norman and Streiner (2003) was initially used to calculate the threshold for the inclusion of variables for interpretation as latent factors. However, considering the large samples, it produced the critical value of 0.24. This seems to be low, since Tabachnik and Fidel (2007) posit that only variables with loadings of 0.32 and above should be interpreted. Hence, the latter was used as the cut-off point.

Factor scores as estimates of the scores respondents would have received on each of the factors had they been measured directly were saved and used for multiple regression analyses. This made it possible to reduce a large number of variables to a smaller number of components for prediction purposes.

Internal consistency reliability. A reliable survey collects consistent responses. A Cronbach's alpha estimate of internal reliability was used to determine how all items of a domain related to all other items in the domain. A correlation coefficient of 0 to 1 is produced by this analysis, and coefficients of 0.75 or larger (DeVellis, 1991) were sought for this study. If respondent performance is consistent across the subset of items, the researcher can have some confidence that this performance will generalize to other possible items in the content domain. The correlation between subsets of items provides information about the extent to which items are constructed according to the same specifications. The Cronbach's alpha measure was determined for each section and for the total survey of 43 items. Items requesting demographic information and six open-ended items were not included.

Multiple regression. Multiple regression was used as an analytical strategy to identify the set of predictors for use of research-based information. Hierarchical multiple regression was run on five dependent variables, including use of sources of research-based information and dimensions of its use. Demographic variables entered as the first block. Latent variables resulting from factor analysis and represented by factor scores were grouped and analyzed as the second block of the regression equation.

Open-ended questions' analysis. Content analysis was used as the approach for examining verbatim responses registered in the data file and reducing them into summary form. This analysis yielded the frequency with which certain concepts and characterizations are referred to (Krippendorf, 2004). The process included defining the units of analysis by coding and categorizing, creating meaningful categories into which the units of analysis could be placed, comparing categories and drawing conclusions, and was performed with the NVivo coding software. The unit of analysis was predetermined by the research question and focuses on suggestions provided by school practitioners regarding the sources of research-based information, types of use, opinions about research-based information, individual expertise, awareness activities and organizational factors that may influence practitioners' decisions to use research-based information. Thus, multiple responses by a respondent per category were allowed.

In vivo labelling of respondents' own words was used to code the data. The preceding closed-ended items served as partial frameworks into which some responses to open-ended questions fit, but the full range of possible responses was undefined for all open-ended questions. Therefore, a mixed deductive and inductive approach was used to construct nodes or categories. Certain categories were developed *a priori*, based on the

literature underpinning the research project and were captured in the multiple-choice items. Others were constructed *a posteriori*, based on analyses of the words and phrases in the texts. The categories were created to show links between the codes to form a group of words with similar meaning or connotations. They were mutually exclusive in that no unit fell between two data points, and each unit was represented by only one data point. For instance, if "a magazine" was referred to in the comments, it was coded into "newspapers and magazines." Conversely, if the reference was "ASCD magazine" or "federation newsletter," then it was coded into the category of professional associations' publications.

To test if there is a link between the frequency with which practitioners used research-based information during the past year and their comments about other sources of research-based information, types of use, opinions about research and attitudes towards a set of factors that may influence their decision to use research-based information in their practice, a chi-square test for independence was performed. Use of chi-square tests is inappropriate if any expected frequency is less than 1 or if the expected frequency is less than 5 in more than 20% of the cells. To avoid this situation, four original frequencies of use were collapsed into two, combining "never" and "once or twice" into the category of low-frequency use and "three or four times" and "five times and more" into the category of moderate use.

Secondary analysis: Testing QURBI's generalizability.

To examine whether the questionnaire's psychometric qualities, such as stability of its latent structure, internal consistency reliability and predictive ability, would change

if tested on a broader sample, factor congruence indices and regression comparison coefficients were calculated.

Factor congruence. Since the data were collected by different means, from different samples and at different points in time -- a) in 2007, in Quebec, responses in paper and pencil from secondary school practitioners were required by the Ministry of Education, Leisure and Sport as part of the contract; and b) in 2008, in Canada, online responses from both primary and secondary schools were totally voluntary -- it cannot be assumed that the scores of respondents can be compared in a straightforward manner. Their comparability depends on the level of their equivalence. Interpretative and procedural equivalence was used in this study (Welkenhuysen-Gybels & van de Vijver, 2001). Interpretative equivalence deals with similarities in interpretation of latent concepts across different groups, whereas procedural equivalence examines latent constructs and their operationalization. Construct equivalence is the primary level of procedural equivalence and implies that respondents from different groups attach the same meaning to the construct as a whole. Pairwise comparison of factors for their congruence across the groups was chosen as the method for evaluating construct equivalence or factorial invariance.

Factorial invariance suggests that a construct is equivalent across groups if the factor loadings of items on the latent factor are statistically invariant (measurement error is present) across these groups. The agreement between the factor loadings was measured by congruence indices. Tucker's phi (Tucker, 1951), the proportionality coefficient or congruence index, was calculated using the following formula: $p_x = \Sigma x_i y_i / \sqrt{\Sigma x_i^2 y_i^2}$.

Although this index has an unknown sampling distribution making it impossible to calculate confidence intervals, values higher than 0.9 were taken to indicate factorial invariance, whereas those lower than 0.9 point, to indicate incongruence (Welkenhuysen-Gybels & van de Vijver, 2001).

Following suggestions for testing construct comparability made by Zumbo, Sireci and Hambleton (2003), factor structures for 3 samples: Quebec 2007 (secondary school practitioners), Canada 2008 and Primary school practitioner data were compared for their congruence.

Comparing regression results. To verify the predictive ability of the questionnaire across all samples, the Chow test was performed to examine whether all the regression parameters were equivalent across groups. Originating from econometrics literature, it is an omnibus test (an application of the general linear F-test) to determine if the latent QURBI factors predict the use of research-based information across different groups. Procedurally, it compares a model containing predictor variables with the model containing a dummy variable representing group membership and its interaction with predictor variables. When the test is performed using SPSS linear regression, the results are based on the test of coincidence (hypothesis: the regression line is the same at all levels of a grouping variable) and the test of parallelism (hypothesis: the slopes and intercepts are the same across groups).

Data Optimization.

Screening and cleaning data. Before proceeding with the planned data analyses, the survey data were cleaned to eliminate incomplete answers and answers out

of possible range. Since the data for the project were not entered manually, but downloaded from the survey host, sources of dirty data like data entry errors were impossible to detect. "Skip logic" and "one-choice-only logic" integrated into the online host system also prevented the selection of illogical answers or more answers than are allowable.

The data screening phase started when the first questionnaires were returned. This tactic made it possible to catch problems before the study was far under way. For example, at the end of September 2008, after the first three responses arrived and were scanned, it was discovered that one of the items had been misplaced. The error was fixed and the fielding of the survey continued.

The French and English surveys were closed in early January of 2009. The system showed that there were 92 lurkers and lurking dropouts, those who either viewed the whole questionnaire but did not answer any questions or viewed some of the questions without answering, but also quit the survey before reaching the end. The databases including those who answered at least one survey question were downloaded as EXCEL files. It is at this stage that the complete scan of the data was performed. It revealed that the data on the 43 QURBI items were missing for 214 cases in the English collection and 87 cases in the French one. Since the main objective of the project was to study the use of research-based information and opinions about it, it was decided that subjects who responded to both section 1 (frequency of RBI use) and section 3 (opinions about RBI) should be kept for analysis. In this way, 38 individuals did not answer 10 items in section 1; 59 cases missing 7 items in section 3 were rather answering dropouts in that they may have answered items in the other sections, but quit prior to completing the survey. As a

result, 458 subjects in total were deleted from the databases, leaving 1,153 responses: 855 in English and 298 in French.

After both files were merged, Missing Values Analysis (SPSS 15 add-on) was run for the next round of screening. The analysis showed that individual variables had less than 1% of missing values. Little MCAR's test had $p > 0.05$, showing that the remaining data were missing in a random pattern. Thus, no further deletion was necessary.

To estimate the remaining missing values, expectation maximization (EM) was used. Tabachnik and Fidel (2007) describe the appropriateness of this imputation strategy for exploratory statistical procedures, which this study extensively employs. Being an iterative procedure, EM forms a missing data covariance matrix by assuming normal distribution for partially missing data and bases inferences about missing values on the likelihood under that distribution.

Before screening the data in a multivariate fashion, a check of every variable for skewness and kurtosis was done. Variables dealing with the frequency of use of research-based information as well as types of use deviated from symmetry. Because transformation may threaten interpretation, the variables were not transformed. No extreme departure from normality was found during univariate screening of the predictor variables; skewness and kurtosis were within expected values.

Multivariate outlier analysis was run on the independent variable data. Mahalanobis distance, leverage and influence were the three statistics used to identify the outliers in the dataset. Unduly high values of Mahalanobis distance were detected (critical $\chi^2 = 54.05$, $p < 0.001$) for the 112 cases. However, leverage values remained within the acceptable limits: the highest value was 0.16. According to De Vaus (2002),

only cases with leverage values over 0.5 extremely distort the regression line. Moreover, even if identified, outliers do not always affect correlations much, especially when the sample is large. To examine what happens to the residual when the unusual cases have been removed from the analysis, influence was calculated showing that the values are far below 1.00 (max Cook's D = 0.025). According to Tabachnick and Fidell (2007), only cases with influence scores higher than 1.00 can be suspected of being outliers. Because the other two statistics related to Mahalanobis distance, namely leverage and influence, did not detect outliers, the decision was made to keep all the cases in the dataset for further analysis.

Weighting the sub-samples. To correct for the disproportional sizes of sub-samples and adjust the collected data to represent the population from which the sample was drawn, cases were assigned a weighting factor by which the data are multiplied. The factor was determined by dividing the proportion or quota of the province or territory in the population of school practitioners by the proportion of that province in the sample. The following formula was used for calculation: $w = \%_{quota}/\%_{group}$. Weighted data were used for the primary set of statistical analyses. Descriptive analyses were performed on both raw and weighted data.

Summary

The main research questions for this study were aimed at describing the use of research-based information by school practitioners across Canada in their everyday practice and identifying the predictors of these uses. To obtain information from this broad population in response to these questions, QURBI, a self-reported attitude and

behaviour measure that had been specifically developed and validated in the Quebec secondary school context, was administered online. The online assessment system chosen to deliver the questionnaire to the population of school practitioners ensured participant anonymity and privacy. There was no direct contact with the population of school practitioners. Instead, professional associations, colleges, educational organizations and schools were asked to invite school practitioners to participate in the survey. Both French and English questionnaires were available online as of September 2008. Despite the intended high coverage, the methodological design of this study imposed limitations on the extent to which the results can be generalized from the sample of school practitioners to the larger population of school practitioners in Canada. These limitations were correlational design, self-reports and non-probabilistic sampling. The respondents represented less than 1% of the Canadian population of unionized school practitioners and 80.5% of the targeted number of responses (n = 2,000) predetermined by statistical appropriateness for multivariate analysis.

A complex of statistical procedures was determined by the nature of the primary and secondary research questions in this study and by the nature of the collected data. Descriptive analyses, factor analysis, multiple regressions, mean group comparisons, internal consistency reliability, calculation of factor congruence coefficients and a test of parallelism and coincidence of the regression lines were targeted to answer the research questions. Content analysis was identified as an appropriate approach for analyzing respondents' comments to the questionnaire's open-ended items. This was accompanied by the chi-square test to connect quantitative data with the qualitative responses. To optimize the existing dataset, multivariate cleaning procedures were applied, and weights

were created to make up for the non-representative data. The results of these analyses and the summaries of practitioners' comments to the open-ended questions are presented in Chapter 4; they contribute to the discussion points offered later on in Chapter 5.

Chapter 4

Results

This chapter reports the findings related to the use of research-based information by the groups of school practitioners. Specifically, it attempts to answer questions examining the use of research-based information by school practitioners and the predictors of this use and to broaden the scope and generalizability of the survey instrument developed to measure uses of research-based information. The first section focuses on the information gained from a descriptive analysis of the demographic data and describes the survey participants by presenting a respondent profile. The second section presents primary analyses of the criterion and predictor variables. This section reports the results of the descriptive, factor and multiple regression analyses as well as presents the summary of the open-ended items. The third section presents the analyses comparing the psychometric qualities of QURBI between Quebec and Canada, as well as secondary and primary school data.

Respondent Profile

A respondent profile was created using demographic data from both personal and school variables. Women dominate in the sample of school practitioners. Only 24% of respondents were male, while 76% were female. All age groups were equally represented: 17.6% were 20–29 years old, 28.4% were 30–39 years old, 27.7% were 40–49 years old, and 26.3% were 50 years old and over. The range of service in education for practitioners was one year to more than twenty-seven years of service, with

a mean of twelve years of experience. Respondents included 198 practitioners (17.2 %) with less than three years of experience and 124 (10.7%) with more than 27 years of experience.

Teachers were the largest category of respondents (n = 947; 82.1%), whereas an equal number of school administrators (n = 101; 8.7%) and professional staff (n = 101; 8.7%) responded to the survey. Four respondents did not associate themselves with any group. When these three groups were disaggregated by the years of service, the mean for the teachers and professionals fell between 11 and 15 years, whereas administrators served an average of about 20 years. English is the main subject taught by 30.3% of respondents, while 15% taught French and 11.4% taught Mathematics.

Table 3 shows the distribution of the participants across provinces by occupational groups. The majority of practitioners from all three occupational groups were from Ontario (n = 603), followed by 174 respondents from New Brunswick and 142 from British Columbia. There were few practitioners from the other provinces. Thirty-nine respondents did not relate themselves to any province.

Table 3

Distribution of three groups of respondents across the Canadian jurisdictions

	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	1153

Seventy-one per cent of respondents possess an undergraduate degree and 26% have a master's degree. Respondents with either a pre-university education or an undergraduate certificate account for 1.3% of the sample, as did practitioners with a doctorate degree. Seventy-four per cent of the teachers and 60% of the professionals hold an undergraduate degree, while 54.4% of the administrators have a master's degree. In relation to training and involvement in research, 56.3% of respondents reported having taken some coursework in research methods, and 57.8% indicated having participated in research projects either at the university (28.5%) or with their colleagues in school-based projects (29.3%). Of the practitioners who did not take any coursework in research methods, 42.3% reported having participated in research projects. Conversely, 29.6% of those who did take a research methods course did not participate in research studies either with university researchers or with their colleagues in school-based projects.

In regard to school characteristics, one third of respondents reported working at the secondary level (n = 366), while 60% were primary school practitioners (n = 700). Although 25.8% practitioners responded to the French version of the survey (n = 298), only 3.9% reported French as the language of teaching in their schools. The schools were medium size, with 150–500 students (45.6%), non-metropolitan (89.78%) and public (96.3%). The descriptive data for occupational categories and such school variables as socio-geographical location and school size are represented below in Table 4.

Table 4

Distributions of respondents across the groups of school practitioners, school size and socio-economic areas

	Small schools (0-149)			***Medium-size schools (150-500)***			***Large schools (more than 500)***		
	Teachers	***Administrators***	***Professionals***	***Teachers***	***Administrators***	***Professionals***	***Teachers***	***Administrators***	***Professionals***
Rural	56	11	5	126	18	9	47	4	5
Urban	34	1	3	177	15	15	166	16	13
Suburban	9			100	8	7	82	5	11
Metropolitan	6	1	2	42	4	4	36	5	6
Total	105	12	10	445	45	35	331	30	35

Primary Analysis

The following statistical procedures were conducted to analyze the data collected on the use of research-based information by various groups of school practitioners in their everyday practice. Specifically, they examine whether different categories of school practitioners in Canada vary in their use of research and what are the predictors of use of research by school practitioners across Canada.

Criterion Variables.

Frequency of use of research-based information sources. The second section of the questionnaire asked about school practitioners' use of research-based information, a criterion variable for this study, and included items 16 to 25. To compensate for the unbalanced, unrepresentative sample, the scores were weighted; however, as Table 5 shows, there is no meaningful difference between raw and weighted means and standard deviations. At a glance, teachers lag behind school administrators and professionals in their use of research-based information from all ten sources. However, overall use of research-based information by all three groups of school practitioners is infrequent and in average does not exceed "once or twice during the last year".

Table 5

Use of sources of research-based information (unweighted and weighted means and standard deviations)

Rate the frequency with which you have used the RBI from the following sources during the last year: 4-point scale: "0" – never; "3" – five times and more	***Teachers*** N = 947		***Administrators*** N = 101		***Professionals*** N = 101		***Canada 2008*** *N = 1153*	
	unweighted	weighted	unweighted	weighted	unweighted	weighted	unweighted	weighted
Scholarly documents	1.47(1.06)	1.48(1.07)	2.03(0.95)	2.03(0.91)	1.77(1.14)	1.80(1.16)	1.55(1.07)	1.58(1.08)
Professional publications	1.39(0.99)	1.41(1.00)	1.94(0.96)	1.93(0.93)	1.87(1.05)	1.88(1.04)	1.48(1.01)	1.53(1.02)
Evaluations of your school	1.09(0.95)	1.02(0.96)	1.68(0.96)	1.62(0.99)	1.29(1.06)	1.27(1.04)	1.16(0.97)	1.12(0.99)
Internet, web-sites	1.58(1.12)	1.57(1.12)	1.72(1.11)	1.59(1.14)	1.74(1.15)	1.85(1.14)	1.61(1.12)	1.61(1.13)
Multimedia: video, DVD	1.15(1.02)	1.11(1.01)	1.29(1.02)	1.12(0.96)	1.34(1.14)	1.27(1.13)	1.18(1.03)	1.13(1.02)
Mass media: TV, radio, newspapers	1.09(1.03)	1.08(1.05)	1.18(1.07)	1.06(0.98)	1.17(1.06)	1.11(1.02)	1.11(1.04)	1.09(1.04)
Pre-service training	0.97(1.01)	0.97(1.01)	0.74(0.92)	0.72(0.85)	1.03(1.07)	1.02(1.07)	0.95(1.01)	0.95(1.01)

continued

Rate the frequency with which you have used the RBI from the following sources during the last year: 4-point scale: "0" – never; "3" – five times and more	*Teachers* N = 947		*Administrators* N = 101		*Professionals* N = 101		*Canada 2008* *N = 1153*	
	unweighted	weighted	unweighted	weighted	unweighted	weighted	unweighted	weighted
In-service training, workshops	1.38(0.98)	1.39(0.98)	1.60(0.99)	1.54(0.97)	1.54(1.03)	1.41(1.02)	1.42(0.99)	1.41(0.99)
Professional conferences, presentations	1.18(0.91)	1.17(0.91)	1.64(0.89)	1.61(0.84)	1.56(0.93)	1.53(0.79)	1.26(0.93)	1.26(0.91)
Experts, resource people	1.38(0.95)	1.33(0.95)	1.74(0.90)	1.71(0.91)	1.84(0.91)	1.75(0.79)	1.46(0.96)	1.43(0.95)
Use of RBI composite	1.26(0.66)	1.25(0.67)	1.55(0.65)	1.49(0.63)	1.51(0.74)	1.49(0.71)	1.32(0.68)	1.31(0.67)
Cronbach's alpha =0.86								

Although low use of research-based information was the leading trend for the totality of the responses, each occupational group had its own preferences as to the sources of research-based information. For example, teachers favoured the Internet and Web sites; administrators preferred scholarly publications and professionals opted for professional publications. All three were unanimous about their dislikes: pre-service training was reported as the least frequently used source of research-based information.

To specify the low-threshold uses, the percentage of school practitioners using research-based information with varying frequency across the 10 sources is presented in the Table 6 below: 2.3% of respondents (n = 27) reported that they did not use research-based information last year from any source at all, whereas 0.86% (n = 10) reported using all of them five times or more. The rate of non-use varies and is the highest for such sources as pre-service training, mass and multimedia and school evaluations. A combination of non-use and infrequent use across the 10 sources was reported by 55.5%–70.4% of practitioners.

Table 6

Frequency of use of RBI by school practitioners in the past year

Rate the frequency with which you have used the RBI from the following sources during the last year:	***Never 0***	***Once or twice 1***	***Three or four times 2***	***Five times or more 3***
Scholarly documents	17.3%	38.2%	17%	27.6%
Professional publications	17%	39.8%	21.3%	21.9%
School evaluations	27.7%	41.5%	17.8%	13%
Internet	19.3%	32.3%	16.7%	31.7%
Multimedia	29.8%	38.3%	15.8%	16%
Mass media	33.7%	36.7%	14.6%	15.1%
Pre-service training	41.6%	33%	13.8%	11.6%
In-service training	19.3%	37.3%	25.5%	18%
Conferences	20.8%	45.9%	20.5%	12.8%
Resource people	15%	42.7%	24.1%	18.2%

All 10 items were significantly intercorrelated (see Table 7), so the individual data were collapsed into a linear composite to form the first criterion variable, use of research-based information, which was used for further analysis.

Table 7

Use of sources of research-based information (inter-item correlations)

	1	2	3	4	5	6	7	8	9	10
1	Scholarly documents									
2	Professional publications	0.75**								
3	School evaluations	0.46**	0.48**							
4	Internet	0.53**	0.54**	0.26**						
5	Multimedia	0.46**	0.48**	0.39**	0.58**					
6	Mass media	0.34**	0.40**	0.30**	0.54**	0.68**				
7	Pre-service training	0.29**	0.25**	0.17**	0.26**	0.28**	0.23**			
8	In-service training	0.41**	0.41**	0.36**	0.30**	0.32**	0.26**	0.41**		
9	Conferences	0.40**	0.39**	0.31**	0.29**	0.35**	0.32**	0.21**	.50**	
10	Resource people	0.42**	0.41**	0.38**	0.33**	0.37**	0.33**	0.21**	0.46**	0.52**

* < 0.05; ** < 0.01; *** < 0.001

Comparison of means of use of research-based information between the groups of school practitioners was performed through one-way ANOVA, t-tests and effect size. As Table 8 shows, there are statistically significant differences between teachers and school administrators and school professionals, where the latter two groups use research-based information more often than teachers. No significant difference was found between administrators and professionals. Moreover, a non-significant Levene's test demonstrated that variances between these two groups were approximately equal.

Table 8

Difference between the groups of practitioners on the composite use of research-based information (means, SDs, independent t-test and effect sizes)

Use of research-based information (composite)	***Mean/SD***	
Teachers (n = 947)	1.25(0.67)	
School administrators (n = 101)	1.49(0.63)	
Professionals (n = 101)	1.49(0.71)	
	One-way ANOVA F significance 13.46***(2, 1146)	
	t-values	***Cohen's d***
Teachers vs. administrators	-3.9***	-0.36
Teachers vs. professionals	-3.9***	-0.36
Administrators vs. professionals	0.04	0

* < 0.05; ** < 0.01; *** < 0.001

Despite the effect sizes interpreted as moderate, there is a 74.9% overlap between teachers and administrators and professionals in their use of research-based information from the totality of sources, showing little practical importance of the difference found between these groups.

Frequency of the types of use (dimensions of use). In regard to the second criterion variable asking about the uses that practitioners made of research-based

information, groups' responses fall between "some of the time" (1) and "often" (2). The numbers of those who selected "never" and "always" vary from 5% to 13% depending on the use dimension. For example, 151 practitioners (13.1%) reported having never used research-based information to resolve issues in their everyday practice. On the contrary, improvement of professional practices was reported as the main reason for using research-based information for all three groups (see both unweighted and weighted means, SDs and the reliability coefficient in Table 9 below).

Table 9

Dimensions of use of RBI (unweighted and weighted means and standard deviations by categories of professionals)

Rate the frequency with which you have used RBI during the last year: 4-point scale: "0" – never; "3" – always								
	Teachers N = 947		***Administrators*** N = 101		***Professionals*** N = 101		***Canada 2008*** N = 1,153	
	unweighted	weighted	unweighted	weighted	unweighted	weighted	unweighted	weighted
To achieve a better understanding of issues in your practice	1.46(0.74)	1.45(0.75)	1.77(0.72)	1.68(0.67)	1.80(0.85)	1.87(0.82)	1.53(.76)	1.53(0.77)
To satisfy intellectual curiosity	1.53(0.74)	1.55(0.74)	1.65(0.67)	1.57(0.63)	1.88(0.80)	1.94(0.77)	1.59(.74)	1.60(0.75)
To improve professional practice	1.60(0.74)	1.58(0.74)	1.85(0.73)	1.78(0.66)	1.96(0.84)	1.98(0.81)	1.67(.76)	1.66(0.75)
To reflect on your attitudes and practices	1.42(0.72)	1.41(0.74)	1.67(0.75)	1.60(0.73)	1.70(0.84)	1.71(0.86)	1.48(.74)	1.47(0.76)
To justify or validate your decisions	1.35(0.75)	1.33(0.76)	1.68(0.77)	1.51(0.77)	1.70(0.81)	1.65(0.79)	1.43(.77)	1.39(0.77)
To resolve problems in your daily practice	1.19(0.72)	1.17(0.70)	1.38(0.76)	1.26(0.73)	1.45(0.74)	1.43(0.80)	1.24(.73)	1.22(0.73)
To develop new activities, programs, guidelines	1.57(0.74)	1.53(0.73)	1.7 (0.79)	1.57(0.79)	1.77(0.73)	1.77(0.75)	1.62(0.74)	1.57(0.74)
Conceptual use	1.46(0.63)	1.47(0.65)	1.69(0.62)	1.62(0.57)	1.80(0.75)	1.84(0.74)	1.52(0.66)	1.53(0.67)
Instrumental use	1.45(0.62)	1.43(0.61)	1.64(0.67)	1.54(0.63)	1.73(0.67)	1.73(0.69)	1.49(0.64)	1.48(0.63)
Symbolic use	1.35(0.75)	1.33(0.76)	1.68(0.77)	1.51(0.77)	1.70(0.81)	1.65(0.79)	1.41(0.77)	1.39(0.77)
Cronbach's alpha = 0.92								

According to the literature, all three types of use are not orthogonal because conceptual use usually precedes the use for instrumental and symbolic ends, but can also be an end in itself. Therefore, three linear composites were created to group the observed variables according to the dimensions of use into another criterion variable including conceptual, instrumental and symbolic use of research-based information. Resolving problems in daily practice, developing new activities and programs and improving one's practice pertained to instrumental use. Conceptual use related to achieving better understanding of issues of practical importance, satisfying intellectual curiosity and curiosity and reflecting on attitudes and practices. Justifying or validating one's decisions referred to symbolic use.

At a glance, there exists little distinction among the groups in their use of research-based information for all three ends (instrumental, conceptual and symbolic). To test for the difference, three group means of the three dimensions of use of research-based information were compared by running one-way ANOVA and t-tests and calculating effect size.

Table 10

Means group comparison (means, SDs, independent-sample t test, significance and effect size)

	Conceptual use Mean/SD		***Instrumental use Mean/SD***		***Symbolic use Mean/SD***	
Teachers (n = 947)	1.47(0.65)		1.43(0.61)		1.33(0.76)	
School administrators (n = 101)	1.62(0.57)		1.54(0.63)		1.51(0.77)	
Professionals (n = 101)	1.84(0.74)		1.73(0.59)		1.65(0.79)	
	One-way ANOVA F significance 20.38***(2, 1146)		***One-way ANOVA F significance*** 14.19***(2, 1146)		***One-way ANOVA F significance*** 12.27***(2, 1146)	
	t-values	***Cohen's d***	***t-values***	***Cohen's d***	***t-values***	***Cohen's d***
Teachers vs. administrators	-2.5*	-0.23	-1.86	-0.18	-2.56*	-0.24
Teachers vs. professionals	-6.1***	-0.56	-5.2***	-0.49	-4.54***	-0.42
Administrators vs. professionals	-2.7**	-0.33	-2.3*	-0.31	1.4	-0.18

* < 0.05; ** < 0.01; *** < 0.001

As Table 10 shows, there are statistically significant differences between teachers and school administrators and school professionals where the latter two groups again use research-based information more often than teachers for all three ends. Despite this, the variation of effect size statistics within the moderate range signifies an overlap between all three groups ranging from 84% to 64% and that their limited use of research-based information makes them more similar than different.

Predictor Variables.

QURBI variables. In the questionnaire, 23 independent variables were grouped into four sections in accordance with the available conceptual and empirical evidence. They asked school practitioners about their opinions of research-based information. Their attitudes towards activities raising their awareness about research-based information,

required skills for using research-based information and aspects of school culture and support structure for the use of research-based information in everyday practice.

The descriptive analyses of unweighted and weighted data suggest that, on average, school practitioners are predominantly neutral in attitudes towards research and other factors that may affect their decisions to use research-based information in everyday practice (see Table 11). Nevertheless, a weak pattern of priorities can be traced for the totality of respondents. For example, skills in using information technology, such as the Internet and databases (m = 4.20), and the availability of time to read a journal and apply a new technique (m = 4.19) were rated as the most necessary for using research-based information. Among methods and strategies for raising awareness about research-based information, practitioners value opportunities to discuss research results with researchers (m = 3.85), availability of clear and explicit recommendations (m = 3.81) and demonstrations (m = 3.78) of how to apply research. Among the elements that practitioners contend in their everyday practice and that may affect their decision to use research-based information are facilities and technology (m = 3.89) and presence of supportive environment (m = 3.89). Usefulness of research in guiding and improving professional practice (m = 3.48) and relevance of research to school reality (m = 3.37) are the most sought after properties of research-based information.

The data also show that there is little distinction between the groups of practitioners; all three groups share relatively similar perceptions.

Table 11

Practitioner attitudes towards RBI, activities raising awareness about RBI, skills for using RBI and organizational factors (unweighted and weighted means and standard deviations)

Rate the extent to which you personally agree that... 5-point scale 1 – "strongly disagree," 3 – "neutral," 5 – "strongly agree"	***Teachers*** *N = 947*		***Administrators*** *N = 101*		***Professionals*** *N = 101*		***Canada*** *N = 1153*	
	unweighted	*weighted*	*unweighted*	*weighted*	*unweighted*	*weighted*	*unweighted*	*weighted*
Research-based information								
Is easy to find	3.06(0.92)	3.07(0.93)	3.21(0.95)	3.26(0.88)	3.22(0.94)	3.29(0.87)	3.10(0.93)	3.12(0.93)
Is easy to understand	3.00(0.87)	2.99(0.87)	3.21(0.91)	3.28(0.85)	3.15(0.87)	3.18(0.81)	3.04(0.88)	3.05(0.87)
Is relevant to your reality	3.30(0.98)	3.30(0.99)	3.72(0.78)	3.70(0.85)	3.59(0.96)	3.62(0.90)	3.37(0.97)	3.39(0.98)
Offers timely information	3.14(0.9)	3.11(0.90)	3.36(0.89)	3.26(0.93)	3.40(0.93)	3.32(0.83)	3.19(0.91)	3.15(0.91)
Is reliable and trustworthy	3.21(0.82)	3.24(0.83)	3.53(0.74)	3.52(0.69)	3.45(0.86)	3.42(0.78)	3.26(0.83)	3.29(0.82)
Is useful to guide or improve your professional practice	3.44(1)	3.48(0.97)	3.69(0.88)	3.71(0.78)	3.61(1.02)	3.34(1.02)	3.48(0.99)	3.49(0.96)
Is easy to transfer into your practice	2.99(0.92)	3.00(0.94)	3.20(0.85)	3.20(0.89)	3.39(0.95)	3.47(0.92)	3.05(0.93)	3.08(0.95)
The following activities are useful to make you aware of RBI								
Presentation of research findings tailored to your needs	3.36(0.92)	3.33(0.92)	3.66(0.92)	3.62(0.95)	3.74(0.93)	3.86(0.86)	3.42(0.93)	3.43(0.94)
Your involvement in a research project	3.46(0.92)	3.44(0.94)	3.82(0.83)	3.79(0.87)	3.76(0.93)	3.88(0.92)	3.53(0.92)	3.54(0.95)
Research results accompanied by clear and explicit recommendations	3.76(0.85)	3.76(0.87)	3.96(0.88)	3.96(0.93)	4.04(0.80)	4.07(0.72)	3.81(0.86)	3.82(0.87)
Opportunities to discuss research results with the research team	3.79(0.85)	3.77(0.86)	4.02(0.76)	4.09(0.72)	4.16(0.81)	4.04(0.76)	3.85(0.85)	3.83(0.84)
Regular contacts with people who distribute research-based information	3.46(0.92)	3.45(0.94)	3.63(0.78)	3.60(0.78)	3.91(0.92)	3.99(0.85)	3.52(0.92)	3.53(0.93)
Demonstrations about how to apply research recommendations	3.73(0.91)	3.70(0.93)	3.88(0.82)	3.98(0.78)	4.12(0.81)	4.11(0.76)	3.78(0.90)	3.78(0.91)
Discussions of research-based information with colleagues	3.49(0.91)	3.48(0.91)	3.66(0.92)	3.63(0.95)	3.93(0.81)	3.98(0.73)	3.54(0.91)	3.56(0.91)

continued

Rate the extent to which you personally agree that... 5-point scale 1 – "strongly disagree," 3 – "neutral," 5 – "strongly agree"	*Teachers N = 947*		*Administrators N = 101*		*Professionals N = 101*		*Canada N = 1153*	
	unweighted	*weighted*	*unweighted*	*weighted*	*unweighted*	*weighted*	*unweighted*	*weighted*
The following skills are necessary to use RBI in everyday practice								
Ability to read and understand research publications	3.87(0.88)	3.86(0.88)	4.09(0.77)	4.06(0.76)	4.07(0.83)	4.12(0.79)	3.90(0.87)	3.91(0.86)
Skills to use IT, such as Internet and databases	4.17(0.80)	4.19(0.81)	4.36(0.68)	4.36(0.69)	4.37(0.71)	4.45(0.66)	4.20(0.78)	4.23(0.79)
Ability to assess the quality of research-based information	3.76(0.87)	3.75(0.89)	3.99(0.82)	3.89(0.84)	4.16(0.79)	4.26(0.77)	3.82(0.87)	3.82(0.89)
Expertise to translate research findings to practice	3.74(0.91)	3.69(0.93)	4.02(0.77)	4.06(0.75)	4.25(0.78)	4.26(0.77)	3.81(0.90)	3.80(0.92)
Use of RBI is influenced by the following organizational factors								
Available time to read a journal, apply a new technique, etc	4.17(0.84)	4.19(0.83)	4.30(0.89)	4.29(0.99)	4.23(0.71)	4.17(0.71)	4.19(0.83)	4.20(0.83)
Available facilities and technology	3.89(0.89)	3.89(0.89)	3.83(0.97)	3.85(0.98)	3.90(0.85)	4.02(0.76)	3.89(0.90)	3.90(0.89)
Incentives, such as remuneration, honoraria, lessening of the workload, etc.	3.35(0.13)	3.35(1.12)	3.27(1.19)	3.32(1.18)	3.00(1.16)	3.15(1.18)	3.31(1.14)	3.31(1.13)
Opportunities to challenge established habits and traditions	3.60(0.90)	3.62(0.92)	3.86(0.79)	3.88(0.74)	3.74(0.88)	3.76(0.85)	3.64(0.89)	3.66(0.89)
Organizational importance for professional development	3.60(0.90)	3.62(0.92)	4.05(0.75)	4.10(0.75)	3.88(0.86)	3.95(0.89)	3.67(0.90)	3.71(0.92)
A supportive environment	3.84(0.87)	3.83(0.88)	4.14(0.75)	4.16(0.73)	4.11(0.81)	4.21(0.76)	3.89(0.87)	3.91(0.86)
Human resources, such as the availability of qualified staff	3.79(0.89)	3.76(0.92)	4.01(0.87)	4.08(0.77)	4.07(0.90)	4.15(0.92)	3.83(0.90)	3.84(0.92)
Organized groups, such as unions, granting agencies and media	3.03(1.03)	3.00(1.04)	3.08(1.06)	3.00(0.93)	2.96(1.03)	2.99(0.99)	3.03(1.04)	2.98(1.02)

Exploratory factor analysis (PCA) was performed to test the correspondence between conceptual structure imposed on the questionnaire and empirical structure of the independent variables (see Table 12) for the whole sample using unweighted and weighted scores. Factor structure for three separate groups of school practitioners was not tested because of the minimal difference between them. Using the criterion of

eigenvalues larger than one and the structure provided by the screeplot, four factors were extracted. Alternating Varimax and Oblimin rotations produced similar results in regard to the solution and factor structure. A simple four-factor solution explained 60% of the variance and was consistent with the hypothesized structure. Only two item loadings were weak. Availability of time to read research findings and availability of facilities and technology tended to load more on the factor of individual expertise about the use of RBI. Although the cross-loaded items might be dropped from further consideration (Schultz & Whitney, 2005), it was decided to force them into the organizational factor that was seemingly most relevant.

Hence, practitioners' opinions about research-based information and their attitudes towards awareness activities, expertise and organizational features as factors affecting their decision to use research-based information in practice were the four latent factors (referred to as QURBI factors). Since there was no meaningful difference between the solutions based on the raw and weighted data, the resulting weighted factor scores were saved for further analyses.

Table 12

Loadings, percentage of variance explained, eigenvalues and internal consistency reliability of the four factors

	Awareness activities		***Opinions***	***Expertise***	***Organiza-tional factors***
Factor: Awareness activities	unweighted	weighted			
Contacts with people who distribute research	**0.75**	**0.77**	0.22	0.09	0.25
Demonstrations about how to apply research recommendations	**0.72**	**0.76**	0.11	0.20	0.20

	Awareness activities		*Opinions*		*Expertise*		*Organizational factors*	
Factor: Awareness activities	unweighted	weighted						
Opportunities to discuss research results with colleagues	**0.76**	**0.73**	0.16		0.17		0.23	
Your involvement in a research project	**0.70**	**0.71**	0.24		0.18		0.13	
Research results accompanied by clear and explicit recommendations	**0.69**	**0.69**	0.18		0.33		-0.02	
Opportunities to discuss research results with the research team	**0.66**	**0.60**	0.26		0.30		0.06	
Presentation of research findings tailored to your needs	**0.57**	**0.59**	0.32		0.26		0.07	
Eigenvalues	10.3	10						
Variance explained	39.7%	38.9%						
Cronbach's alpha	0.85							
Factor: Opinions about RBI			unweighted	weighted				
Is easy to understand		0.05	**0.74**	**0.74**	0.16		0.08	
Offers timely information		0.19	**0.74**	**0.73**	0.11		0.10	
Is easy to transfer into your practice		0.26	**0.70**	**0.69**	0.10		0.13	
Is easy to find		0.08	**0.69**	**0.68**	0.02		0.17	
Is relevant to your reality		0.33	**0.68**	**0.67**	0.17		0.05	
Is reliable and trustworthy		0.30	**0.62**	**0.63**	0.19		0.06	
Is easy to guide and improve your practice		0.17	**0.54**	**0.55**	0.32		-0.06	
Eigenvalues			2.5	2.6				
Variance explained			9.6%	9.8%				
Cronbach's alpha			0.814					
Factor: Expertise					unweighted	weighted		
Ability to assess the quality of RBI		0.33		0.36	**0.71**	**0.67**	0.04	
Skills to use IT such as internet and databases		0.34		0.19	**0.66**	**0.66**	0.13	
Ability to read and understand the research publications		0.38		0.31	**0.64**	**0.64**	0.10	
Expertise to translate research findings to practice		**0.43**		0.39	**0.63**	**0.51**	0.07	
Eigenvalues					1.7	1.7		
Variance explained					6.4%	6.6%		
Cronbach's alpha					0.81			
Factor: Organizational factors							unweighted	weighted
Organized groups such as unions, granting agencies and media		0.07		0.15		-0.11	**0.79**	**0.79**

	Awareness activities		*Opinions*	*Expertise*	*Organizational factors*	
Factor: Awareness activities	unweighted	weighted				
Incentives	-0.02		-0.06	0.11	**0.77**	**0.75**
Human resources, such as availability of qualified staff	0.25		0.07	0.21	**0.73**	**0.75**
Organizational importance for PD	0.24		0.21	0.21	**0.64**	**0.65**
Supportive environment	0.20		0.13	**0.43**	**0.63**	**0.64**
Opportunities to challenge established habits and traditions	0.15		0.23	**0.44**	**0.51**	**0.51**
The available facilities and technology	0.11		0.08	**0.58**	**0.44**	**0.43**
The available time to read a journal, apply a technique	0.23		0.04	**0.61**	0.32	0.30
Eigenvalues					1.1	1.2
Variance explained					4.2%	4.6%
Cronbach's alpha					0.77	
IVs: KMO measure of sampling adequacy = 0.95						
Four-factor solution: total variance explained = 60%						
Complete questionnaire: Cronbach's alpha = 0.942						

Reliability assessment was conducted to see the degree to which test scores are free from errors of measurement. Internal consistency reliability analysis was run both for the whole instrument and for each constituent section or factor, with the omission of the items indicated by factor analysis. This exposed the extent to which the question responses for each observed variable were correlated with the overall score on the corresponding section of the questionnaire. Presented in Tables 5, 9 and 12, Cronbach's alpha coefficients vary from 0.77 to 0.92 for separate sections and 0.94 for the complete questionnaire. The coefficients are satisfactory (DeVellis, 1991) and confirm internal consistency of the self-report scales.

Relationship between use of research-based information and factor variables. Multiple regression was used to answer the question about the predictors of use of research-based information. Once the relationship is known, this

information shows which variables are the strongest predictors of the criterion variables: use of research-based information sources by school practitioners and the three dimensions of use. For regression purposes, criterion variables were represented by composite scores. Factor scores were used for the four QURBI factors. Such predictors as coursework in research methods, participation in research projects and job responsibility were dichotomized.

Table 13

Intercorrelations among criterion and predictor variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Criterion variables																
1. Use of RBI sources																
2. Conceptual use	.66***															
3. Instrumental use	.68***	.83***														
4. Symbolic use	.53***	.71***	.71***													
Predictors: *Individual characteristics*																
5. Gender	.04	.05	.05	.06												
6. Experience	-.01	.05	-.05	.01	-.10**											
7. Responsibility	.15**	.16***	.13***	.14***	-11**	.13**										
8. Coursework	.21**	.21**	.17**	.19**	.0	-.04	.08									
9. Participation in research	.32***	.34***	.30***	.26***	-.02	.14**	.14**	.30***								
10. Grade	-.03	-.04	-.10*	-.10*	-.24***	.03	.06	.03	.05							
School characteristics																
11. School size	.04	.02	.01	.04	-.11**	.03	.00	.00	.03	.33***						
12. School location	.06	.05	.03	.04	-.05	.01	-.11**	.00	.10**	-.01	.25***					
13. Language of teaching	-.04	.01	.05	.03	.07	.02	-.09*	-.01	.00	-.09*	.05	.06				
QURBI factors																
14. Opinions about RBI	.35***	.43***	.46***	.37***	.01	.06	.11**	.07	.20***	-.04	.00	.04	.01			
15. Awareness activities	.20**	.26**	.22**	.19**	.05	.00	.19**	.02	.13**	-.05	-.02	.04	-.02	.0		
16. Expertise	.16**	.17***	.13**	15**	.04	.02	.04	.15**	.16**	.00	-.04	.03	-.02	.0	.0	
17. Organizational factors	.02	.01	.01	.05	.00	.07	-.01	-.04	-.02	-.03	.00	-.14*	.01	.0	.0	.0

* < 0.05; ** < 0.01; *** < 0.001

As a starting point, intercorrelations between the criterion and predictor variables are presented in Table 13. The table shows that the significant relationships among the four criterion variables were relatively strong and positive. Given that the coefficients were generally less than 0.80, we may conclude that each of these variables measures a dimension of the practitioners' use of research-based information.

Out of 13 predictor variables, individual variables, such as gender and educational experience, and school properties, such as size and location, did not correlate with any of the four criterion variables (marked light grey in Table 13). Therefore, they were not considered as potential predictors. At the same time, job responsibility, coursework in research methods, prior participation in research and grade level, as well as three QURBI factors (opinions about research-based information, attitudes towards awareness activities and individual expertise) were found to correlate relatively consistently across dependent variables. Whether practitioners work in secondary or primary school was negatively related to only two criterion variables, the instrumental and symbolic use of RBI, showing that elementary teachers may use RBI sources for these two ends more often. Although statistically significant, the correlations are modest.

Organizational factors were found to be correlated only with the use of research to back up actions and decisions, and showed no relation to instrumental and conceptual use or the use of RBI sources.

This intercorrelation matrix also provides information about interrelationships among the predictor variables. While most of the coefficients were not statistically significant, a few demonstrated relationships between variables. These correlations were quite modest, suggesting that assumptions about multicollinearity would not be violated

for the multiple regression analyses. Job responsibility and coursework in research methods were correlated with participation in research projects, suggesting that school administrators, professionals and those who had taken research methods classes seemed to have more prior experience participating in research projects. School practitioners also tended to have more positive opinions about research and to value activities raising their awareness about research. Practitioners with more research experience (through coursework and participation in research projects) are more positive in their attitudes towards research skills necessary for their everyday practices.

Hierarchical multiple regressions were used to assess the extent to which the relationships observed between predictors and four criterion variables held true, while controlling for the influences of other predictors. Sets of predictors were entered in two blocks. The first block included the following individual characteristics: job responsibility, coursework in research methods, prior participation in research projects and grade level. Four QURBI factors were entered in block two. As Table 14 shows, statistically significant individual characteristics alone explained 11%, 12%, 10% and 10% of variance of all four criterion variables. After controlling for demographic variables, QURBI factors accounted for a statistically significant 11%, 21%, 21% and 15% of variance in the use of RBI sources and three dimensions of use. Overall, eight predictors accounted for 22% of variance in the use of RBI sources, 33% in conceptual use, 31% in instrumental use and 25% in symbolic use.

Table 14

Summaries of three hierarchical regression models with demographic and individual data included

Criterion variables		*R square*	*R square change*	*F change*	*df*
Use of RBI sources	Model 1	0.11	0.11	31.57***	4, 1042
	Model 2	**0.22**	0.11	38.25***	4, 1038
Conceptual use	Model 1	0.12	0.12	37.47***	4, 1042
	Model 2	**0.33**	0.21	79.43***	4, 1038
Instrumental use	Model 1	0.10	0.11	31.42***	4, 1042
	Model 2	**0.31**	0.21	78.86***	4, 1038
Symbolic use	Model 1	0.10	0.10	28.47***	4, 1042
	Model 2	**0.25**	0.15	52.48***	4, 1038

* < 0.05; ** < 0.01; *** < 0.001

Table 15 displays the results of four separate two-model regression analyses corresponding to each of the dependent variables. The pattern of results suggests that opinions about research-based information are the most important predictor (ß coefficient varies from 0.33 to 0.42). Attitudes towards awareness activities and individual expertise are two other significant QURBI factors. Prior participation in research projects and coursework in research methods also significantly predict the use of research and its dimensions. The impact of the grade level variable was only significant for the instrumental and symbolic dimensions of use, whereas that of organizational factors was only significant for the symbolic use of RBI; however, their unique contribution was almost negligible. Job responsibility was not a significant predictor. As expected, these findings confirmed the results in the correlation matrix.

Table 15

Summary of hierarchical regression coefficients (betas) using QURBI factors and controlling for demographics and individual characteristics

	Use of RBI		***Dimensions of use***					
			Conceptual		***Instrumental***		***Symbolic***	
Models	***M1***	***M2***	***M1***	***M2***	***M1***	***M2***	***M1***	***M2***
Individual characteristics:								
Prior participation in research ("0" – no participation; "1" –worked with university researchers or colleagues on school-based projects)	0.25***	0.17***	0.26***	0.15***	.25***	0.14**	.22***	0.13***
Job responsibility ("0" –teacher; "1" – administrators and professionals)	0.08**	0.04	0.13***	0.05	.10*	0.04	.10**	0.04
Coursework in research methods ("0" – no coursework; "1" – taken or in progress)	0.11**	0.10**	0.10**	0.09**	.07*	0.10***	.09**	0.08**
Grade level ("0" – primary; "1" – secondary)	-0.06*	-0.03	-0.06*	-0.02	-.12***	-0.09**	-.11***	-0.08**
QURBI factors:								
Awareness activities		0.16***		0.23***		0.19***		0.21***
Organizational factors		0.04		0.03		0.003		0.08*
Opinions about RBI		0.33***		0.39***		0.42***		0.33***
Individual expertise		0.12***		0.15***		0.12***		0.10***

* < .05; ** < .01; *** < .001

Open-ended comments.

Despite the fact that open-ended questions add biases to a survey, to triangulate the data collected through the questionnaire's multiple-choice items and to permit more freedom in the individual's responses, open-ended questions were included.

Each of the six sections of the questionnaire was followed by an open-ended item that gave respondents an opportunity to create their own responses to the questions. They asked practitioners to consider a) other sources of research-based information they use in their day-to-day practice; b) other purposes for which they use research-based information; c) other opinions they have about research-based information; d) other activities that make them aware of research-based information; e) other skills and competencies that may help practitioners use research-based information; and f) other organizational factors that may affect their decision to use research-based information.

In this survey, the open-ended questions were the most commonly skipped—only 43.9% of survey respondents (n = 504) took time and commented on at least one of the six items. The data file included comments by 84.1% of teachers (n = 424), 6.6% of school administrators (n = 33) and 9.3% of professional staff (n = 47). This pattern was somewhat similar to that in the general sample.

Other sources of research-based information. In total, 401 school practitioners commented on the first open-ended question. However, 39 of them provided irrelevant answers such as "none," "I think you covered all the sources I use," "there are many sources, too many to list" and the like. These responses were excluded from the analysis of this question. Among 362 practitioners who provided meaningful responses there were 303 teachers, 25 administrators and 33 school professionals. In connection to

the frequency of the self-reported use of research-based information from the totality of sources, 133 respondents reported having used it from "never" to "once or twice" and 229 of them used it from "three or four times" to "five times or more." A cross tabulation of suggested sources and frequencies of use of research-based information are shown in Table 16.

Table 16

Summary of sources of research-based information suggested by practitioners

	"Never" – "once or twice" (n = 133)	"Three or four times" – "five times or more" (n = 229)
Assessments	2	11
Books	27	60
Colleagues	35	81
Curriculum	16	23
Experience and anecdotes	8	14
Experts	5	14
Journals	6	15
Mentors and administrators	3	24
Ministry publications	14	32
Newspapers and magazines	9	12
Teachers' own research	1	5
Programs and textbooks	16	21
Professional development activities	7	28
Research databases	1	2
School board publications	13	25
Student research	1	5
Professional association publications	6	18
University courses	1	13
Web resources	32	41

A chi-square test was run to check if there is a statistically significant relationship between sources of information suggested by school practitioners and frequencies with which they use research-based information. The test shows that there is no significant relationship between those who use research more or less frequently and the 19 categories of sources they suggested ($\chi^2 = 23.28$; df = 18; p = 0.18), implying that the

pattern of source preferences is likely to be independent of the self-reported behaviour of use of research-based information.

As seen in Table 16, sources listed by practitioners were well within the categories presented in the close-ended questions about sources of research-based information. Other suggested sources of information were far from being research-based by nature and referred rather to the practitioner's craft knowledge. However, 91.7% of respondents listed a blend of sources of both craft and research knowledge. The practitioners' comments suggested that the distinction between these two types of sources is quite vague. Quite often, professional development activities that by definition should serve the cause of professionalization may lack a research base. For instance, "resource teachers give workshops to teachers in schools about new instructional practices, but they 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." Conversely, collegial exchanges traditionally thought of as a source of craft knowledge may serve as a conduit of research knowledge: "I believe that a teacher is more likely to implement a new practice if it comes from a colleague who has tried it." The following summarizes practitioners' responses.

When asked to add to the existing list of research-based information sources, school practitioners reported having used a broad variety of sources in their everyday practice. These vary considerably from sources of general interest, such as Wikipedia and YouTube, to research and statistical databases, such as EBSCO, Scopus and Statistics Canada, from information supplied by professional associations and support agencies to

that generated by teacher and student research and teachers' own experience, as well as anecdotal information.

Colleagues were ranked as the top reference source (n = 116). Notably, this category was identified as fellow- and co-teachers, peers and members of professional communities and personal learning networks. However, only 23 respondents attributed opportunities to share resources, information and experience, and participate in conversations and discussions as the most valuable aspect of these immediate at-work links.

The casual character of information flow and exchange by means of collegial contacts was contrasted with the relative unimportance attached to centralized information provided by the federal and provincial governments (n = 46), professional unions and associations (n = 24) and school boards (n = 38). Thirty-nine practitioners identified curricula and curriculum guides for subject areas produced by the ministries of education to be paramount research-based resources. Along with those resources, print resources such as normative documents and regulations, strategy outlines and resource packages were reported to be used in school practices. Only 13 practitioners referred to provincial assessments, such as DRA (Diagnostic Reading Assessment), CASI (Comprehension, Attitude, Strategy and Interest) and accountability results by such governmental agencies as the Educational Quality and Accountability Office. National and international professional association[1] publications in the form of newsletters,

[1] For example, ASCD (Association for Supervision and Curriculum Development); NCTM (National Council of Teachers of Mathematics); NLTA (Newfoundland and Labrador Teachers' Association); OECTA (Ontario English Catholic Teachers' Association); OPHEA (Ontario Physical and Health Education Association); ETFO (Elementary Teachers' Federation of Ontario).

bulletins and speaking series were noted as suppliers of research-based information. Research-based information was provided by the school boards to practitioners not only through a variety of publications, such as intra-school memos, documents and newspapers, but also through the expertise of specialists, consultants, resource professionals (n = 19) and professional development venues. The latter included professional activity days, learning seminars and workshops, summer institutes and conferences, to name a few (n = 35).

School potential in communicating research findings to their practitioners was realized through a system of school actors and activities. Mentors and school administrators pass on examples and recommendations on how to apply research-based approaches to everyday practice and encourage reflection on school-generated assessment data (n = 27). This dialogue usually unfolded during school council, cycle and curriculum team meetings (n = 10). A few respondents referred to their own research (n = 4) and their students' research and feedback (n = 6) as a basis for their practices.

Fourteen practitioners emphasized university education as a source of research-based information. They reported having referred to course materials, study packages in Special Education, Applied Psychology and research projects related to their undergraduate and graduate degree training. Some viewed meetings with university professors as a valuable source of information to nurture their practices.

Preference for books (n = 87) was much more considerable than for academic journals (n = 23). Practitioners (n = 17) quoted authors from whom they sought information: for instance, Diller's writing on literacy work stations, Caulkin's works on primary writing, van de Walle's student-centred mathematics. They (n = 19) also referred

to such programs as Teaching-Learning Critical Pathway and Expanded Co-operative Education. The following research topics were reported to have driven practitioners to find and use research in their practice: multiple intelligences, learning taxonomies, knowledge organizers and concept building, and instructional strategies such as corrective and guided reading, student-centred teaching and co-operative learning.

Although books were mentioned to be the main information medium, information communication technology was emphasized as an increasingly popular channel of research findings to school practitioners (n = 73). TeacherTube and Edublogosphere were mentioned as providing access to sharable global resources in education. Surprisingly, only three practitioners referred to research-based Web resources, such as academic databases and statistical data collections. Information delivery was favoured through a number of educational Web sites (for instance, edhelper) and those of professional associations, webcasts of ministries of education, email alerts and RSS feeds.

In addition, 18 practitioners capitalized on the use of experience and five more mentioned anecdotal information sources nurturing their everyday practice.

Types of use of research-based information. In total, 235 practitioners commented on the question requiring them to add other types of use of research-based information. Of this number, 220 had answered question one about other sources of research-based information and 15 did not provide comments to question one. Three groups of school practitioners were represented in the following way: 198 (84.3%) were teachers, 13 (5.5%) were school administrators and 24 (10.2%) were professionals.

It is important to note that 51.4% of the comments (n = 121) were irrelevant: 65 respondents made comments like "nothing else to add," "can't think of any," "unable to

answer this question satisfactorily"; 56 practitioners were confused and either responded "the stem is not clear to me" or provided information about sources of research-based information, such as "educational magazines" or "see earlier answer." All of these were not included, leaving 114 cases for further analysis. In regard to the self-reports of use of research-based information from the 10 sources, respondents included 25 who used research less than once or twice and 89 practitioners who used it from three to four times to five times or more. Table 17 shows their cross tabulation with the types/dimensions of use.

Table 17

Summary of use dimensions as suggested by practitioners

	"Never" – "once or twice" (n = 25)	"Three or four times" – "five times or more" (n = 89)
Conceptual use	11	30
Instrumental use	19	68
Symbolic use	2	3

To test for the association between the users of research-based information and the practitioner-suggested types of use, a chi-square test was performed. Because at least 20% of expectant values were less than 5, Yates' correction was employed. The resulting Yates' chi-square = 0.27, df = 2, p = 0.87 showed no statistical difference between the self-reported frequency of use and suggested dimensions of use. As suggested in the literature, the uses of research-based information fell into three dimensions: instrumental, conceptual and symbolic. The summary of responses follows.

Use of research for instrumental ends was the broadest category in this study (n = 87) and targeted students and classrooms, school and professional communities, parents

and teachers themselves. Such tasks as helping students with special needs, classroom management, increasing student motivation, evaluating student performance and, overall, empowering students in their learning drove practitioners to consider research-based information as a classroom tool. Involvement with school and professional communities encouraged school practitioners to use research-based information to develop school policies and instructional programs; advocate for new programs and technologies; plan collaborative activities; coach, mentor and support colleagues; prepare professional development workshops; report or communicate assessment data; and analyze results and present them in professional publications and at conferences. Uses of research-based information to fuel collegial discussions (n = 44) were reported most frequently. The topics cover "whether to expect 'success' (however defined) from programs such as SuccessMaker", "whether there is research support for using 'pull-outs' to improve literacy," "teaching methodology to older teens (15-, 16-, 17- year old)." Persuading parents about a particular course of action and supporting them on their way were reported by thirty-one practitioners. Researching and reviewing own teaching, substantiating new methods and testing programs and curriculum for rigour prompted practitioners to utilize research findings. A curious use of research as a protective shield against "less informed, jealous professionals" was reported once.

Conceptual use of research-based information (n = 41) occurred mainly to support practitioners in setting goals and developing expectations. Research-based information was used to reflect, make decisions, develop a personal philosophy of teaching and check the path of practice. A few practitioners viewed research as useful to keep themselves

intellectually stimulated. They reported having used research findings to challenge their own ideas and as a source of inspiration.

Symbolic utilization of research to legitimize actions without necessarily changing practices or taking action was not abundant (n = 5), but was quite varied, and included personal advancement. Political or persuasive uses included justifying assessment results and methods for decision-making. A few practitioners reported using research-based information to persuade parents of a particular course of action. The details provided by practitioners do not make it possible to conclude to what extent these uses were manipulative or deceptive, and thus cannot be interpreted as misuse of research.

Opinions about research-based information. Three hundred and nine practitioners commented on their opinions about research-based information; 34 of them did not comment on the first open-ended question about the sources of research-based information. There were 241 teachers, 28 administrators and 40 professionals. We excluded 53 irrelevant responses from the analysis, leaving 256 valid responses. In regard to the frequency of use of research-based information, 101 respondents either did not use it or had used it once or twice in the past year. The cross tabulation is presented in Table 18. One hundred and fifty-five respondents used it from three to five times or more. A chi-square test was performed to see if there was an association between the frequency with which research-based information is used and practitioners' opinions about research showing no such relationship ($\chi^2 = 8.87$, df = 8, p = 0.35)

Table 18

Summary of practitioners' opinions about research

	"Never" – "once or twice" (n = 101)	"Three or four times" – "five times or more" (n = 155)
Irrelevant	26	50
Inaccessible	8	18
User-unfriendly	14	19
Implementation challenging	16	16
Ideologically biased	9	13
Methodologically problematic	7	11
Necessary	16	19
Arousing critical thinking	4	6
Neutral	12	6

School practitioners' opinions about research-based information vary widely. At the same time, their distribution is far from being normal and is positively skewed. In their comments, practitioners tended to emphasize the qualities that research-based information was lacking.

Thus, the main criticism was levelled against the irrelevance of research (n = 76), "being out of touch with reality" and "hypocritical." Research-based information 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 criticize it for being "too broad a spectrum" and impossible to relate consistently to classroom situations, whereas others judge it as "narrowly focused," ignoring "possible or combined reasons for the results," To account for the situation, a few reasons were listed repeatedly: a) researchers who never taught or did it so long ago that "they lost touch with the realities of the classroom"; b) too much

research is driven by US trends, "extrapolating American findings on Canadian practices"[2]; and c) research findings often do not relate to the curriculum, "the big ideas from the ministry." Four teachers mentioned that teachers' involvement in research would ensure its relevance. One of them pinpointed that "partnerships involving practitioners in practical research and knowledge transfer should be favoured."

The user-unfriendliness of research presentation was picked as the next point for criticism (n = 33). On the one hand, research is perceived as "flowery," "complicated," "dense," "overwhelming" and "convoluted." Practitioners described it as "overburdened with catchphrases and keywords that hide the true impact," "inaccessible for quick reading" and "loses its meaning when being accessed." Instead of the "use of edu-speak," "edu-babble" and "Thesaurus definitions" that turn practitioners off, they would like to read simple, plain and usable language. Short and clear reports incorporating "actual examples" as well as summaries and syntheses with "a ball park figure to gauge effectiveness" are the research products that practitioners sought. On the other hand, some school practitioners (n = 10) acknowledge that by and large, practitioners' ability to understand research is limited. This refers especially to "statistics" in research reports. This is how one of the teachers put it: "I have observed truly dreadful misuse of statistical data by administrators and superintendents at staff meetings and in-services. They should have done it better since they are supposedly graduates of Masters in Education Administration courses in our board . . . ." Pre-service education and professional

[2] Many questioned the quality of the US model of education.

development activities were noted as opportunities for developing skills to read and interpret research results.

Contact with research is often limited, not only because of its conceptual difficulty, but also because of its physical inaccessibility. Twenty-six practitioners emphasized that research-based information is difficult to find, which discourages them from considering research in their practice. Firstly, practitioners do not have access to online libraries and databases because money is the object for schools and individual practitioners. Those who have access reported being in contact with universities. They are either university students or maintain contact through their previous jobs. Practitioners living in remote communities do not have adequate access unless "they have a university nearby with a Faculty of Education and a library open to the public." Instead, "hard copies of the outdated research papers distributed at school and school board" are the only sources of research-based information available to them. In this respect, timeliness of research becomes a concern for practitioners (n = 7).

Even if research-based information is accessed, read, understood and found relevant, there are a number of challenges to its systematic implementation (n = 32). Lack of clear, strategic and comprehensive recommendations from the research, lack of support and resources, large classes, lack of time to plan for the change and modify the information to meet students' needs, and the mere stress of the day "often cause practitioners to lapse into a more traditional pedagogical method because it offers the path of least resistance, not because it is best practice."

Hidden and not so hidden political and ideological agendas attached to research by governing agencies do not contribute to the usability of research-based information in

school practitioners' opinions (n = 22). One of the practitioners compared it to "pendulum swings"; another wrote in despair: "Research can be used to prove anything you want it to support . . ." Another practitioner provided an example: "Although the study reported that six weeks was the shortest time that a teaching-learning critical pathway had been completed (with the longest pathway lasting up to a year), my board has decided that we will do a new pathway every six weeks." Educational groups and organizations were reported not only to push the patterns based on their priorities, but also to ignore and hamper practitioners' initiatives to use research findings they think are relevant in their everyday situation. This is what one of the practitioners wrote: "As a teacher I may have a new idea based in solid research, but if it does not fit the Min. of Ed. or District or Principal's belief, it becomes a challenge . . ." It is even more complicated when the expectations and requirements of ministries and boards conflict, turning practices into "a political minefield." Practitioners strongly oppose getting involved in such a "battle of duelling experts" and "haring wildly off in all directions."

Some school practitioners (n = 18) could not avoid criticizing the methodological quality of educational research, claiming it lacked rigour (that is, poorly designed and biased) and therefore contained inconclusive, unreliable and invalid findings. Discrepancies in methodological solutions used to answer specific research questions may be so huge that it becomes impossible for practitioners to compare the results of the studies.

Eighteen practitioners were neutral in their opinions about research-based information. They evaluated research as "sometimes far-fetched, sometimes relevant and

credible." A few respondents commented that asking this question to practitioners is not legitimate as it "all depends upon the research and who did it."

Despite the predominantly negative opinions about research-based information expressed in the practitioners' comments, a few strengths of research were highlighted. It was referred to as valuable (n = 18) for its ability "to direct professional practice and personal opinions," "to feed new understanding which helps to find new ways of doing things," "to validate practice," "to bring about the possibility of multiple perspectives" as well as being an important (n = 5) and necessary (n = 3) component of educators' effectiveness and professionalism. Practitioners also acknowledged its critical potential (n = 8) for individual and organizational change and improvement. Research-based information "challenges you to give up methods and strategies that you use simply because you use them and to begin to think critically about what you are doing and why" and "provokes collaborative discussions among staff, and the school can only benefit from these conversations."

Practitioners' attitudes towards awareness activities. Out of 261 individuals who commented on the activities that may raise practitioners' awareness about research-based information, 26 did not comment on the first open-ended question. Of those who commented, 224 were teachers, 16 were administrators and 20 were professionals. There were 69 irrelevant responses (for instance, "nothing to add") that were excluded from the analysis, leaving 192 valid comments. As Table 19 shows, 75 respondents were infrequent users of research-based information, and 117 reported having used it more than three times in the past year. To test for the pattern of association

between the frequency of use and awareness activities, a chi-square test was run (Yates' $\chi^2 = 6.7$, df = 8, p = 0.35), showing the absence of such a pattern.

Table 19

Summary of awareness activities suggested by practitioners

	"Never" – "once or twice" (n = 75)	"Three or four times" – "five times or more" (n = 117)
Demonstrations	23	28
Teams, colleagues, networks	10	30
Professional development	11	26
Experiential activities	2	9
Experts	4	6
Contact with researchers	9	7
Participation in research	3	3
Own research	2	3
Technology as delivery medium	8	21
Access	4	7

In school practitioners' comments about the activities helping them to become aware of research findings, the main focus was placed on demonstrations about how the findings of a particular study can be used in classroom practices (n = 51). To be useful these demonstrations should reflect reality, but not model it, and show how findings can be incorporated into practice seamlessly. Practitioners reported they would also appreciate lesson plans and assessment activities developed on the basis of research findings. They could be incorporated in workshops and seminars delivered in person or as video clips via the Internet.

Again, collegial discussions were spotlighted in practitioners' comments (n = 40). Notably, they are valued as the most effective way of sharing how to search for research and interpret it, discussing the significance and applicability of research outcomes to practitioners' particular situations and exchanging experiences in research

application. Professional dialogue with both immediate and remote colleagues was acknowledged as equally useful. School leadership and grade-level team meetings, reading groups, and staff and council meetings were suggested as opportunities to encourage exchange of research-based information within schools and beyond them.

Another excellent opportunity for enhancing research-based discourse among practitioners was professional in-service training (n = 37), which includes not only professional development days and workshops, but also additional qualification courses and conferences. An important place was given to hands-on, experiential activities where practitioners "get a chance to practice the skills and strategies that were being reported in the research" (n = 11). Communication professionals such as school educational consultants were reported to play a special role in raising awareness of research (n = 10).

Contact with researchers (n = 16), participation in research (n = 6) and conducting own research (n = 5) made it possible to directly exchange with researchers, gain skills and experience and communicate the needs of school practice to academia. Broadening outreach from academia to school practice was viewed as a means to enhance awareness.

Although practitioners preferred human interaction as a means for becoming aware of research-based information, technology was also viewed as a powerful conduit of research-based information (n = 29). Besides consolidated research on the Web sites of professional associations, such resources as videos or webcasts were noted as a means to observe researchers discussing research topics, results and recommendations. Web sites for peer-sharable resources, blogs, forums, monthly email notifications, online message boards and subscription lists informing practitioners of recent research would provide dissemination options to help them "choose which would be most suited to their

situations." The existence of an open-access meta resource, such as "access point," "tool box," "resource bank" or "central list of research," consolidating summarized/synthesized applied educational research, accompanied by clear recommendations and video demonstrations and structured by subject or problem areas was identified as another longed-for facility to improve school practice. Another suggestion was a forum supported by educational research experts, providing research-informed answers to practitioners' questions.

Practitioners' attitudes towards expertise about the use of research-based information. Comments were given by 218 practitioners, 12 of whom did not comment on the additional sources of research-based information. Seventy-two comments were irrelevant (for instance, "nothing to add") and were excluded from further analysis. Valid responses were given by 120 teachers, 13 administrators and 13 practitioners. Out of these, 57 practitioners fell into the range of those who used research information "once or twice," while 86 used it "three or four times" or "five times or more." The cross tabulation with skills considered important to use research in their everyday practice is presented in Table 20. A chi-square test of independence was run to test for their association (Yates' $\chi^2 = 6.08$, $df = 5$, $p = 0.29$) and showed no link between the frequency of use and importance of the skills to use research.

Table 20

Summary of skills as suggested by practitioners

	"Never" – "once or twice"(n = 57)	"Three or four times" – "five times or more" (n = 86)
Information search skills	2	12
Appraisal skills	14	16
Skills to relate and adapt research to practice	13	17
Skills to summarize and communicate research	1	8
Research skills	1	7
Willingness to use research	3	3

However, school practitioners identified the following sets of skills as focal for their use of research-based information. These include information search skills (n = 14), research appraisal skills (n = 30), expertise to relate and adapt research results to practice (n = 30), ability to summarize and communicate available research findings (n = 9) and skills to conduct own research (n = 8).

Ability to find relevant online educational publications through search engines and familiarity with accessing research databases were reported as necessary prerequisites of research utilization. At the same time, practitioners acknowledge the paramount importance of research literacy allowing for understanding of research-based information. In their opinion, these skills refer to a) reading and understanding of the vocabulary used in research; b) reading research with a reasonable amount of scepticism, "weeding out the pertinent information and skipping the superfluous bits"; c) "taking apart" or evaluating research for its bias and appropriateness of analyses; and d) understanding the meaning of results and "conclusiveness of conclusions."

Another important skill for the use of research-based information is to be able to extrapolate the findings in order to address specific issues and situations. These include abilities to a) associate research to the needs of classrooms, schools and boards; b) combine research results with practical strategies for the classroom; c) select elements that may partially apply; and d) adapt research findings to concrete situations.

Skills to simplify, synthesize and communicate research-based information were highlighted by school administrators, since they are largely responsible for promoting and supporting school change. These skills are necessary for them to "synthesize research trends to show where the field is going" and to communicate research findings efficiently in "teacher language for teachers" and "without consuming teachers' time."

Practitioners emphasized that skills in conducting research would help them improve their practice and instil "the desire to experiment and use new methods" and "a critical attitude towards the research of others."

Problem-solving skills were unanimously perceived as necessary to use research-based information; however, a few practitioners pinpointed the need for problem-formulation/location skills (n = 4). In order to know what type of information they were looking for, practitioners needed the ability "to judge which areas of their teaching they needed help with" and "to discern where 'lacks' exist and what needs they are trying to meet."

Practitioners also highlighted a number of personal dispositions (n = 6) to encourage the use of research-based information. These were "willingness to improve and learn," "flexibility and openness to new ideas," "courage to support research-based practices despite common preconceptions," and "confidence and intellectual honesty."

Although the comments focused on the individual expertise necessary to use research-based information in everyday practice, quite often school practitioners (n = 39) refocused the question and referred to external expertise instead. For them, an expert is a "more knowledgeable other" who relates to professionals and bodies (sometimes involving teachers) and whose major functions are 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 research-based information in a particular situation.

Practitioners' attitudes towards organizational factors. Regarding other organizational factors that may influence practitioners' decisions to use research-based information, 240 practitioners provided comments: 24 of them did not comment on other sources of research-based information, and 61 comments were irrelevant (for instance, "nothing to add") and were excluded from the analysis. Of those who commented, 151 were teachers, 9 were administrators and 19 were professionals. As before, the comments were matched with the low-frequency users of research-based information (those who did not use it or used it once or twice during the past year) and moderate users (used it three or four times, or five times or more). Table 21 presents these categories. Chi-square analysis was performed to test for the association between the groups of RBI users and the factors that may affect their decision to use research-based information in their everyday school practice ($\chi^2 = 2.9$, df = 6, p = 0.8) showing no such relationship.

Table 21

Summary of organizational factors as suggested by practitioners

	"Never" – "once or twice"(n = 74)	"Three or four times" – "five times or more" (n = 103)
Time	17	30
Facilities and resources	10	14
Collegial and parental support	9	21
Administrator's encouragement	20	29
Professional development opportunities	6	11
School board support	9	11
Support from ministry and unions	2	8

Lack of time was commented as the most important barrier to practitioners' decision to use research-based information (n = 47). This is how time problems were described by one of the respondents: "My preps are seldom used for preparation. They are used for paper work and admin stuff like counting money turned for field trips, doing my attendance register manually each month like in the dark ages. All my preparation is done after school and my marking is done at home. Implementing new strategies is very time consuming and with hardly any PD [professional development] days, when is one supposed to develop lessons incorporating new strategies?" Time is needed to search out sources, read, understand, reflect and incorporate ideas into practice. Some practitioners suggest that "if we are truly to be a 'profession'" the time to engage in the use of research-based information should be formally allocated by the job contract (approved by the union) and assigned by school administrations or school boards. To save time, others demand ready-made materials: "Just provide the data and the appropriate lesson plan, and I am in . . ." Others, however, feel use of research-based information to be 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."

In addition to time, availability of resources is of concern to school practitioners. Providing access to research was on the list (n = 12). It was underlined that the school and the employer should encourage reading of current research by providing access to journals and newsletters, emailing research or placing the materials in teacher lounges. Professional development days and teacher conferences should be used to present research findings on a regular basis. Appropriate funding was also reported essential to initiate and implement new directions at school and to cover costs of professional development, technology and support staff necessary for the systematic change (n = 12). Specifically, practitioners (n = 7) valued regular paid in-service opportunities organized by schools, school boards and ministries which link practice with research-based information.

At the same time, the issue of support and encouragement was reported as another critical issue for school practitioners (n = 92). Expecting support from many, school practitioners count mainly on school administrations (n = 49) as they "can allow time," "encourage team meetings" and "promote a safe working environment for research inquiry." However, for the use of research-based information to become a priority in school practice, it should become a priority for school leaders: "Emphasis and priority on research-based information needs to start with school administration in order to effectively filter down to teachers." "You get involved when the administration (principal, superintendant, consultant, chief superintendant) tells you it is a concern; when it is not seen as concern, no focus is there . . ." This summarizes the importance of

push effort for research-based school practices. Since there is possibly only a fine line separating engaging and encouraging initiative from authoritative force and pressure, some practitioners (n = 3) 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."

To be efficient, the proactive leadership in research-based information utilization should be combined with the effort of the school team, the "school community" in its most inclusive meaning. Twelve practitioners commented on the need for a "critical mass of people" who unite to "buy into research" and "support proposed directions." Other elements potentially contributing to the spirit of research-based school practices were having a) colleagues who are doing research themselves or are involved in successful implementation of research findings (n = 23); b) parental support (n = 7); and c) support from a number of players, such as school boards (n = 20), professional unions and governments (n = 19).

Unfortunately, practitioners' comments indicate that the above-mentioned conditions are a "pie in the sky." They reproach administrations of various levels (n = 5) for a) only "pretending to implement" new approaches and supporting a fossilized tradition of school practice impermeable to educational change; b) manipulating schools to suit school board stipulations, not the school interest; and c) being the dead-end in channelling research to school practitioners.

Yet, under similar circumstances some practitioners (n = 18) remain self-reliant and capitalize on their own teaching philosophy and interests, as well as their students' interests. One of the teachers commented: "Often infrastructure support is insufficient,

the resources are minimal, but I cope." Viewing the use of research-based information on individual endeavours, another teacher stated: "It is up to individuals to search for and implement new research," Another remarked: ". . . use of research is not influenced by anyone . . . I've used it extensively to improve myself and my teaching . . ."

Secondary Analysis

To answer the second set of research questions pertaining to testing the stability of the questionnaire's psychometric properties (construct stability, predictive ability and internal consistency reliability) as a result of broadening its scope by adding primary school practitioners and those from other jurisdictions in Canada, a set of comparative analyses was performed. The Quebec 2007 sub-sample included responses from 459 secondary school practitioners. These data were collected in 11 comparison schools in 2007, in the province of Quebec, for the study evaluating the New Approaches New Solutions strategy aimed at increasing student success and reducing drop-out rate. The responses of 2,425 school practitioners from the treatment schools were used for the QURBI validation briefly described in the Methods section. Three samples were compared: secondary school practitioners (Quebec 2007) versus primary school practitioners (primary 2008) and versus the Canada 2008 sample of school practitioners from which 65 practitioners from Quebec were excluded. Province and grade level were not the only factors accounting for the difference between the samples; the medium through which the questionnaire was administered and the method for selecting participants contributed to the distinction. Quebec 2007 secondary school practitioners were required to respond to the paper-and-pencil questionnaire.

Factor comparison and congruence. To test the correspondence between the conceptual structure imposed on the questionnaire and the empirical structure of the independent variables across the three samples, exploratory factor analysis (PCA) and a test of the scale congruence were performed (Table 22).

Table 22

Loadings, percentage of variance, eigenvalues, internal consistency and factor correlations explained by the two factors for the three samples

	Quebec 2007 secondary school (n = 459)	***Canada 2008 (n = 1,088)***	***Primary school 2008 (n = 700)***
Factor: Organizational factors	**Component 1**	**Component 4**	**Component 4**
Supportive environment	0.86	0.63	0.58
Human resources, such as availability of qualified staff	0.81	0.72	0.68
Organizational importance for PD	0.79	0.63	0.59
Incentives	0.76	0.77	0.79
Opportunities to challenge established habits and traditions	0.76	0.52	0.49
The available facilities and technology	0.70	0.44	0.40
Organized groups such as unions, granting agencies and media	0.67	0.79	0.80
The available time to read a journal, apply a technique	0.61	0.33	0.28
Eigenvalues	10.9	1.1	1.2
Variance explained	42%	4.1%	4.5%
Cronbach's alpha	0.92	0.77	0.75
Factor: Awareness activities	**Component 2**	**Component 1**	**Component 1**
Opportunities to discuss research results with colleagues	0.83	0.76	0.75
Contacts with people who distribute research	0.83	0.74	0.74
Demonstrations about how to apply research recommendations	0.82	0.71	0.70
Research results accompanied by clear and explicit recommendations	0.77	0.71	0.70
Opportunities to discuss research results with the research team	0.75	0.68	0.65
Your involvement in a research project	0.66	0.68	0.69
Presentation of research findings tailored to your needs	0.62	0.52	0.57
Eigenvalues	3.16	10.5	10.3
Variance explained	12.2%	40.4%	39.5%
Cronbach's alpha	0.92	0.85	0.85

	Quebec 2007 secondary school (n = 459)	*Canada 2008 (n = 1,088)*	*Primary school 2008 (n = 700)*
Factor: Opinions about RBI	**Component 3**	**Component 2**	**Component 2**
Is relevant to your reality	0.80	0.71	0.66
Is easy to transfer into your practice	0.79	0.61	0.67
Offers timely information	0.76	0.75	0.73
Is easy to understand	0.75	0.75	0.75
Is easy to guide and improve your practice	0.75	0.54	0.53
Is reliable and trustworthy	0.71	0.61	0.60
Is easy to find	0.705	0.68	0.70
Eigenvalues	2.2	2.51	2.5
Variance explained	8.5%	9.6%	9.6%
Cronbach's alpha	0.898	0.814	0.79
Factor: Expertise	**Component 4**	**Component 3**	**Component 3**
Ability to assess the quality of RBI	0.83	0.71	0.71
Ability to read and understand research publications	0.81	0.64	0.65
Skills to use IT such as Internet and databases	0.79	0.65	0.62
Expertise to translate research findings to practice	0.76	0.65	0.69
Eigenvalues	1.55	1.6	1.5
Variance explained	5.96%	6.3%	5.8%
Cronbach's alpha	0.94	0.81	0.81
IVs: KMO measure of sampling adequacy	0.938	0.95	0.94
Four-factor solution: total variance explained	68.6%	60.5%	59.5%
Complete questionnaire: Cronbach's alpha	0.938	0.942	0.94

Using the criteria set above, four factors were extracted. Variance explained varied from 68.8% for the Quebec secondary school sample, 60% for the Canada sample and 59.5% for the primary school sample. A simple four-factor solution was stable across the target samples and consistent with the hypothesized structure. It included the following four latent factors: practitioners' opinions about research-based information and their attitudes towards awareness activities, expertise and organizational features as factors affecting their decision to use research-based information in practice.

Organizational factors contributed maximally (42%) to the Quebec secondary school factor structure, whereas this contribution was slightly higher than 4% for Canada and primary school structures. At the same time, awareness activities for the latter two samples accounted for the bulk of variance. These were 40.4% and 39.5%, respectively. Approximately equal contributions for all three samples were given by the opinions about RBI and skills necessary to use RBI.

The magnitude of factor loadings also differed between the samples. For the Quebec secondary school practitioner sample, the lowest loading was 0.61. In the other two samples, two item loadings went as low as 0.40 and 0.28. These items were "attitudes towards the available facilities and technology" and "available time to read a journal and apply a technique." Although originally intended for and loaded to the organizational factor, both items were unstable and cross loaded instead to the individual expertise factor in the Canada and primary school samples. Because of their conceptual importance for school practitioners, as indicated in their comments, the decision was made to categorize them into the organizational factor that was seemingly most relevant.

Table 23 demonstrates that the test of scale congruence between the samples is satisfactory, proving an acceptable degree of stability of factor structure across a variety of educational contexts: Quebec versus Canada, and secondary school practitioners versus primary school practitioners.

Table 23

Comparison of factor structure (Tucker's congruence coefficients)

	Quebec 07 – Canada 08	*Secondary (07) – Primary (08)*
Organizational factors	0.91	0.90
Awareness activities	0.99	0.98
Opinions about RBI	0.97	0.97
Expertise	0.99	0.99

Internal consistency reliability analysis was performed both for the whole instrument and for each constituent section across the three samples. The visual comparison of the extent to which the question responses for each observed variable were correlated with the overall score on the corresponding factor shows that these coefficients for the Canada and primary school samples somewhat deteriorated, although were acceptable. At the same time, Cronbach's alphas for the questionnaire in total were stable and satisfactory. As Table 22 shows, they remained around 0.94 for all three samples.

Testing the predictive ability of the questionnaire. To test for stability of the predictive ability of the questionnaire originally developed in the Quebec educational context and for secondary school practitioners, the Chow test of differences among the regression coefficients for the three samples was performed through multiple regression procedures. Two-stage moderated multiple regressions were run for four criterion variables (use of RBI sources and instrumental, conceptual and symbolic use of RBI). Four QURBI factors entered the equation in the first block. The second block included dummy variable representing group membership (Quebec vs. Canada; secondary school practitioners vs. primary school practitioners) and was followed by the interaction of dummy variables with all the predictors.

As Table 24 below shows, it is evident that the hypothesis of coincidence should be rejected only for the first criterion variable "the use of RBI sources". The regression lines for predicting the use of research-based information from the four QURBI factors are different at all levels of both grouping variables. F change shows that there is a difference between Quebec 2007 and Canada ($F(5, 1537) = 11.03$, $p < 0.000$), as well as between the secondary and primary school practitioners ($F(5, 1140) = 7.17$, $p < 0.000$).

The test of parallelism produced consistent results when comparing both intercepts and slopes of all groups. The results show that intercepts (means) for predicting the use of RBI sources differ significantly between school practitioners from Quebec and Canada ($t = 5.23$, $p < 0.000$), as well as between practitioners from primary and secondary schools ($t = -4.6$, $p < 0.000$). Standardized beta coefficients indicate that, on average, practitioners from the Canada sample use research 0.12 standard deviations more than their counterparts from the Quebec 2007 sample, whereas practitioners from the primary school sample surpass their colleagues from the secondary school sample by 0.13 standard deviations.

In regard to the slopes, variation in practitioners' opinions about research-based information made the difference between Quebec and Canada samples ($t = 4.68$, $p < 0.000$), showing that for one standard deviation of increase in practitioners' opinion scores, there is a 0.20 standard deviation increase in the use of research-based information in the Canada sample. The difference between primary and secondary school practitioners ($t = 5.2$, $p < 0.00$) showed that change in opinions by one standard deviation predicts the growth of 0.12 standard deviations in the use of research by practitioners working in primary school.

Table 24

Difference in regression coefficients (beta-coefficients, degree of significance, R square, F and F change)

	Use of RBI	***Conceptual use***	***Instrumental use***	***Symbolic use***
Model 1: *Quebec 2007 vs. Canada 2008*				
Step 1				
ORGANIZ	0.023	0.034	0.035	0.095, t = 3.49***
AWARE	0.15 t = 6.3***	0.18 t = 7.96***	0.19 t = 8.2***	0.17 t = 6.9***
OPINION	0.31 t = 13.1***	0.37 t = 16.72***	0.38 t = 16.33***	0.33 t = 13.7***
EXPERTISE	0.16 t = 6.93***	0.19 t = 8.76***	0.17 t = 7.3***	0.14 t = 5.7***
R^2	0.146	0.21	0.22	0.17
F significance	66.02***	106.76***	108.196***	78.026
Step 2				
Quebec–Canada	0.12, t = 5.23***	-0.01	-0.01	-0.033
Qc_C_org	-0.081	-0. 085	-0.09	-0.023
Qc_C_aware	0.054	0.019	0.012	0.024
Qc_C_opinion	0.20, t = 4.68***	0.083	0.09	0.08
Qc_C_expert	0.04	0.023	-0.07	-0.022
R^2 change	0.03	0.008	0.01	0.003
F change	**11.03*****	**2.9**	**3.25**	**1.28**
Model 2: *Secondary school vs. Primary school practitioners*				
Step 1				
ORGANIZ	0.05	0.059	0.074	0.12***
AWARE	0.14***	0.17***	0.17***	0.14***
OPINION	0.24***	0.31***	0.32***	0.28***
EXPERTISE	0.19***	0.21***	0.20***	0.14***
R^2	0.12	0.17	0.18	0.13
F significance	38.3***	61.1***	64.3***	44.1***
Step 2				
Secondary-primary	-0.13, t = -4.6***	0.002	0.057	0.024
Sec_prim_org	0.053	0.075	0.071	-0.002
Sec_prim_aware	-0.038	-0.009	-0.002	-0.005
Sec_prim_opinion	-0.12, t = -3.2**	-0.050	-0.045	-0.035
Sec_prim_expert	-0.029	0.002	0.041	0.014
R^2 change	0.027	0.005	0.009	0.001
F change	**7.17*****	**1.3**	**2.6**	**.36**

* < 0.05; ** < 0.01; *** < 0.001

In regard to instrumental, conceptual and symbolic use of research-based information, the analyses confirm the null hypothesis of the coincidence and parallelism tests, showing that the predictive ability of the questionnaire does not vary across the samples. Neither incremental F nor group differences in intercepts and slopes showed

significant disparity among the groups. All four QURBI factors are significant predictors of use of research-based information for all three ends.

Having concluded that the regression lines for the use of research-based information sources differed significantly across groups, it is necessary to obtain within-group regression lines to examine the groups' slopes. Two standard multiple regressions were run on the data file split into the target samples.

Table 25

Multiple regression beta-coefficients

	Quebec 2007	***Canada 2008***	***Primary***
ORGANIZ	0.10	-0.08	0.014
AWARE	0.11	0.16	0.16
OPINION	0.15	0.37	0.30
EXPERTISE	0.17	0.16	0.21
R	0.27	0.44	0.40
R^2	0.075	0.20	0.16

Based on the model fit coefficients (R square), the Canada and primary school data explain greater variation in the practitioners' use of research-based information scores. As standardized beta-coefficients show (see Table 25), for these two sub-samples, opinions about research were the major predictors, while they accounted for a smaller amount of variation in the Quebec 2007 data, ceding their place to skills to use research.

To complete the examination of differences of questionnaire predictive ability in various samples, tests of coincidence and parallelism were conducted on the Quebec 2007 (n = 459) and Quebec 2008 (n = 65) sub-samples. The data collection time and medium were distinct. The two-step multiple regression model yielded no significant results showing the regression lines for both groups coincide and are parallel. The results

summarized in Table 26 imply no differences between the respondents from Quebec in 2007 and 2008, that is, between those who were required to respond to the paper and pencil questionnaire (Quebec 2007) and those who volunteered to respond to the online version (Quebec 2008).

Table 26

Difference in regression coefficients (beta-coefficients, degree of significance, R square, F and F change) between Quebec 2007 and 2008 samples

Use of RBI Quebec 2007 vs. Quebec 2008	*Step 1*	ORGANIZ	AWARE	OPINION	EXPERTISE	R^2	F significance	*Step 2*	Quebec07-Quebec08	07_08_org	07_08_aware	07_08_opinion	07_08_expert	R^2change	F change significance
		.11**	.13**	.14***	.18***	.08	0.9•••		.091	.017	.039	0.017	.035	.012	.3

* < 0.05; ** < 0.01; *** < 0.001

Instead, the results may suggest that the predictive ability of the questionnaire varies in relation to the province, emphasizing the dissimilarity between the uses of research-based information by respondents from Quebec and their counterparts from other Canadian jurisdictions.

Summary

The results of the analyses provided answers to the main and secondary research questions posed in this study. In addition, a demographic profile of the school practitioners who participated in this survey was developed.

In the primary analysis, the information gained from the descriptive and group mean comparison results answered the main question concerning how different groups of school practitioners vary in their use of research-based information sources. These

analyses generated evidence that the overall uses of different sources of research-based information are infrequent by all groups of school practitioners. Although school administrators take the lead over teachers and school professionals in their use of RBI sources, this difference remains practically unimportant. All three groups reported having used research-based information instrumentally, that is, to improve professional practice. School practitioners were uniformly neutral in their opinions about research-based information and attitudes towards the factors that may influence their decision to use research in everyday practice. However, individual expertise was shown to be of more importance for the use of research-based information, as were opportunities to discuss research with the research team and availability of time to read research and apply new techniques. Support staff and a supportive environment were also valued.

The multiple regressions answered the second question concerning predictors of use of research-based information sources and the three dimensions of use. Factor scores representing four factors potentially affecting use of research-based information and scale scores for demographic predictors were sequentially regressed on the composite scores of criterion variables. Although the variances explained by the models were quite modest, there were a few findings worth noting. Practitioners' opinions about research were the strongest predictor of use. Demographic factors, such as prior participation in research projects, coursework in research methodology and job responsibility, as well as QURBI factors, such as awareness activities and individual expertise, were found to be consistently statistically significant predictors of RBI use.

Echoing statistical results, open-ended content analyses provided more insight into school practitioners' (predominantly teachers') practices and beliefs, showing no

difference between low- and moderate-frequency users. Practitioners valued information coming through informal and formal channels. Collegial networks as well communications from governments, professional associations and school boards were reported as the most important sources. The enabling function of technology in this process was recognized for its potential to overcome distance and time lag. Practice improvement and student empowerment were reported to be the most sought-after ends of using research-based information as a classroom tool. At the same time, practitioners were quite reserved in their opinions about research-based information. In their majority, they believe it is irrelevant and detached from the classroom and school realities. Physical and conceptual inaccessibility of research-based information was also an issue. A number of factors were pinpointed for their potential to compensate for the perceived "flaws" of research findings. These factors included clear demonstrations about how to apply research findings in their everyday practice; individual skills to access, appraise, translate and apply research findings as well as personal dispositions; external expertise, available time and administrative support and encouragement.

The secondary analysis targeted testing the questionnaire's generalizability beyond the Quebec and secondary school teacher samples. Satisfactory congruence of factorial structure was found between the three samples: Quebec 2007 secondary school practitioners, Canada 2008 school practitioners and primary school practitioners. The predictive ability of the instrument remained constant when comparing the Quebec 2007 and Quebec 2008 samples. However, the instrument explained three times more variance in the use of research-based information for the Canada 2008 and primary school practitioner samples.

Chapter 5

Discussion

The primary purpose of this study was to describe whether and how various groups of school practitioners utilize research-based information in their everyday practice and to identify the predictors of this use. Secondarily, it tested the psychometric properties of the questionnaire originally developed for secondary school practitioners in Quebec.

The information gained from this study can be used by a wide range of education leadership organizations, such as school boards, professional associations, teacher colleges, ministries and educational organizations, to plan efforts designed to provide a research-evidence basis for school practices and to build school capacity to use research to inform their practices. Teacher education institutions may use this research to identify vectors to educate teachers as a research-based profession; such as, involving future teachers into research activities. Universities and research agencies may consider these findings to plan activities to bridge the gap between research and practice; for instance, by using effective research communication strategies, engaging practitioners in research. In addition, this research can serve as a foundation for future studies concerned with the use of research for educational change. This chapter discusses the findings taken from the results, their implications for practice and recommendations for future research.

Findings

Before discussing the findings of this study, it is important to remember that its methodological properties, such as self-reports, correlational design and nonprobabilistic sampling, place limitations on the extent to which the results from the sample group can be extended to the general population of school practitioners. Therefore, the findings of this study refer mainly to the population of school practitioners who, at the time of the study, were members of professional unions, had strong rapport with their professional associations and were responsive to their requests, regularly consulted their union's Web site, subscribed to and read a newsletter in either electronic or paper form and, finally, took an interest in the survey topic and were willing to self-report their attitudes and behaviours towards their professional practice.

Despite the severe limitations, a number of interesting findings were gleaned from this study in relation to school practices regarding the utilization of research-based information, practitioners' opinions and attitudes as predictors of this use and the usability of the instrument employed in this study to collect the data.

Evidence of use of research-based information. In the absence of within-education studies examining the differences in research use by different groups of educational practitioners, this study is akin to the studies comparing educators with doctors and other professional groups and identifying the role of research in educational practices as traditionally weak (Hannan et al., 2000; Beard & Williams, 1992; Latham, 1993). The findings also agree with the studies of homogeneous samples reporting that utilization of research-based information is infrequent by school practitioners (Conseil

supérieur de l'éducation, 2006; Green & Kivdahl, 1990; Cousins & Walker, 2000; Lafleur, 1995; McNamara, 2002; Williams & Coles, 2003, 2007). While all three groups remain within the low-threshold of research use, school administrators may take a very modest lead over teachers and school professionals. Practitioners' comments substantiate the lack of distinction between the groups in terms of their preferences regarding the sources of research-based information and the ways they are used in everyday practice.

Although the issue of non-use of research-based information has been generally out of the scope of the existing empirical research, this study reveals the considerable rates of non-use of research-based information, which raises concerns and questions. The most important concern is that in every other discipline and profession, progress and improvement are dependent on scientific advancement, while in education, only a few research-based practices are implemented with fidelity and rigour. Under such circumstances, the systemic success of educational enterprise is a pie in the sky, and the reality is that 25% of fifteen- and sixteen-year olds in Canada are below minimum standards, according to the PISA[3] results. The dropout rate in Quebec has increased from 26% to 29% in the recent years.

Specifically, a combination of non-use with low-threshold use yields approximately 55% to 75% of respondents who either used research-based information once or twice during the past year or did not use it at all. Some explanation to this overall situation is suggested in the practitioners' comments, where special emphasis was placed on the use of their own experience as the only source of information exclusively useful

[3] OECD Programme for International Student Assessment

for their everyday practice and all other sources were ignored. Cordingley (2009) provides an alternative, although empirically untested, explanation of the non-use. She claims that practitioners may experience difficulty identifying situations when they used research-based information. Practitioners might have appropriated the research to such an extent that it became inseparable and indistinguishable from their own professional frames of reference.

The data does not allow for defining whether non-utilization was intended or unintended. A discussion of the non-use of specific sources of research-based information, especially those which, by their design are expected to be practitioner-friendly sources, is needed to understand the reason why the rate of non-use is high. For example, more than 41% of respondents reported having not referred to the research component of their initial teacher programs. On one hand, the specificity of this source may suggest that only novice practitioners may find it reasonable to refer to this source to compensate for their lack of experience (Cousins & Walker, 2000). In this sample only 17% of respondents have less than three years of experience, and no observable relationship has been found between teaching experience and the use of research-based information. On the other hand, the contribution of initial teacher education to forming an actionable research knowledge base for future teachers and instilling a research-based culture might have been insufficient. In their qualitative comments, a few practitioners voiced their concern that there are a number of reputable schools of education that made the teacher-researcher education paradigm optional: "... folks get a MEd without even doing an action research project."

Support for educational practitioners through the system of professional development activities and scaffolds remains insufficient as a result the system does not serve as a point of reference for research knowledge for almost 20% of respondents. Thirty-seven per cent of respondents referred to it no more than twice in the past year. First, it is not clear to what extent the scaffolding structure for continuous professional development is present in schools. Second, the research-based nature of the proposed activities is not evident either. Third, the "open access" status of professional activities cannot be taken for granted. The following comment eloquently describes a probable situation with professional development practices: ". . . the train the trainer model that is the mantra of "professional learning communities" ill serves those truly interested in applying research-based knowledge and learning to their classroom teaching. Let's be honest—it's to save money. Information becomes garbled . . . The principal's friends are sent out for development during the school day with release time and supply coverage, while the rest of us are "trained" at a voluntary after-school meeting, and given no collegial work time."

The high rate of non-use of school evaluation data by school practitioners, where 27.7% did not use it at all, is at odds with the argument that practitioners are more eager to use local data, which is primarily valued for its contextual relevance as opposed to the research generated in academia (Lafleur, 1995). The amount of effort that administrations put into making these data available and usable to their staff in the process of making collegial decisions about school progress is unknown. Instead, the comments suggest that these results may end up piling on the principals' desks. The degree of practitioners' engagement in conducting evaluations is also unknown. Previous research (for instance,

King, 1995) indicated that increased participation in data production and the subsequent growing sense of ownership enhance the potential that this information will be acted upon. Instead, in this study a number of practitioners questioned the usefulness and quality of such data. For instance, "testing, methodologies and purposes for gathering the data do not seem to have been at all consistent, so it is hard to see how much true weight should be given to this research" or "information obtained from looking at the [title omitted] results does not properly reflect a student's intellect . . . Despite this, I still use the results to give me an overall picture of the needs of students in our needy school."

Although uses of research-based information were rather infrequent, both quantitative and qualitative data show the existence of a pattern of preferable sources, suggesting the nature of information favoured by school practitioners. For example, the literature reports that teachers prefer to use printed media (Everton et al, 2000) and value traditional library facilities (Williams & Coles, 2003). In this study, practitioners' comments rate high traditional media such as books; however, the quantitative data show the Internet to be the top most frequently used source of information by 48.4% of respondents, after scholarly and professional publications. Practitioners commented that information-communication technology possesses a great capacity in connecting research findings and practitioners by opening access to research-based information and reducing the physical distance between researchers and practitioners. Practitioners also emphasized information-communication technology potential to support the informal exchange of practice-relevant information between colleagues through professional forums and networks. These changing preferences can be explained by the increasing availability and accessibility of technology and World Wide Web resources in schools. For example,

according to Statistics Canada 2008 data, 97% of schools in Canada are connected to the Internet. However, considering the percentage of respondents who reported non-use and low-criterion uses of Web resources, it is important to say that there is no direct link between access to technology and its use for professional learning. This echoes findings of the phenomenological study of educational reform performed in Quebec by Sassville (2004), revealing that only 50% of school teachers in the province used technology as a learning resource. Williams and Coles (2007) underline the importance for school practitioners to view information-communication technology as tool for professional development but not as a tool to be used exceptionally within the classroom.

When asked about other important sources of research-based information, practitioners persistently suggested their immediate and distant colleagues. In accordance with Bandura's theory of social construction of knowledge, collegial interactions are valuable for their potential to foster meaningful sharing, discussion, reflection and eventual contribution to the development of a learning community predisposed to collaboration and experimentation (Little, 1990; Jarzabkowski, 2002). According to Simons et al. (2003), collective interpretation of data by peers seems to act as a validity filter for acceptance in practice.

Although the Internet, books and collegial networking were suggested as main conduits of research-based information, their research foundation cannot be taken for granted. For instance, the sheer volume of online information, its dynamic nature and minimal amount of peer control raise the pointed question about the quality of information available through the visible Web. 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 over-reliance on blogs, information found through general search tools like Google and Yahoo and that encountered on YouTube and Wikipedia. Moreover, Schneider's (2008) qualitative study of "edubloggers", workplace trainers, suggests that they neither took training themselves, validated their content, nor indicated references.

While collegial networking can help research reach the front lines of educational practice quite quickly and recklessly, the quality of the "word of mouth" stratagem should not be over-estimated either. Davis (2008) argues that these accounts of research cannot be considered as the primary source for decision making in educational practice, as they are oftentimes truncated, decontextualized, blended with anecdotal experiences of the colleague and thus largely inaccurate.

The situation with books as sources of research-based information is far from simple and straightforward as well. Many examples provided by school practitioners in the context of use of research-based information show that these texts have no research foundation, but are rather accounts of practitioner experiences and recommendations (Diller's "Literacy work stations: Making Centers Work"; Caulkin's "Units of study for primary writing: A yearlong curriculum"). The same goes for some of the programs that practitioners referred to, including the expanded Co-operative Education program supported by a provincial Ministry of Education, when no sufficient empirical evidence exists to demonstrate the model's effectiveness at the secondary school level (Kerka, 1999; Grieco, 2004).

Therefore, the question that needs further examination is whether there should be an explicit distinction made in the nature of knowledge communicated to practitioners,

especially through formal channels, or whether the bodies and agencies who are expected to support the process of bringing research to practice should continue to rely on practitioners' inference capacity.

In regard to the purposes for which research-based information is used, practitioners of all ranks reported using it as a practical tool and stated that their main preoccupation was improvement of professional practices. According to their comments, this type of use is twofold. When student-oriented, it presupposes empowering student learning and increasing their motivation. When oriented to practitioners themselves, this type of use deals with researching the process and the product of one's practice. Other instrumental uses were instructional-design oriented and included developing school policies and instructional programs, planning collaborative activities, coaching, mentoring and supporting colleagues, preparing professional development workshops, reporting or communicating assessment data, analyzing results and presenting them in professional publications and conferences. Conversely, existing non-comparative research shows a distinction between groups in the use of research-based information. It is reported that school principals use research for different ends, such as to learn from materials (Saha et al.,1995), to diagnose problems and work out solutions (Englert et al., 2004), to establish criteria and monitor progress in their schools (Torrance, 2002) and to substantiate their intuitive judgements (Wikeley, 1998). Increasing teaching effectiveness (Williams & Coles, 2003, 2007) and reflecting on practices (Conseil supérieur de l'éducation, 2006) were reported as the main concerns for teachers who use research findings in their practices.

Evidence about opinions and attitudes towards research-based information. Contrary to the available research results reporting that educational practitioners (teachers, school principals and professionals) overall value research findings (Green & Kivdahl, 1990; Meline & Paradiso, 2003; Ratcliff et al, 2005; Williams & Coles, 2003, 2007), this study shows that in their attitudes towards research, all groups of respondents prefer to take a neutral stance. At the same time, the substantive comments of practitioners (both frequent and non-frequent users) about research had rather negative connotations. Practitioners perceive research as lacking roots in school reality and therefore irrelevant. The fact that researchers lack contact with school practice and the preponderance of US research data were named as the main causes of such detachment. Research was also described as having insufficient physical and conceptual accessibility for practitioners. In their opinion, highly restricted access to research publications and their convoluted language were to blame.

Practitioners believe that a few measures might be taken to correct the situation. Notably, they highlighted the importance of including clear and explicit recommendations in research publications and accompanying them with demonstrations on how to apply the recommendations in practice. Professional development activities were also valued for their potential to raise practitioners' awareness about research-based information. Individual information search skills, together with skills for appraising and acting upon research evidence, and a willingness and openness to change were claimed to be critical for the use of research. At the same time, the availability of external expertise to help with basic understanding of research and its adaptation and application was also valued. Structural (of all ranks) support was reported as critical for practices, because it

provides a safe working environment for research inquiry by allocating time and encouraging collaboration. Time to read a journal or to apply a new technique, which is connected to all the other factors, either as a cause or an outcome, was consistently stated to be primordial in order to search out sources, to read and understand, reflect and incorporate ideas into practice.

Predicting the use of research-based information. Unfortunately, despite the promising empirical background, truly powerful associations between attitudinal factors and research usage have not been found in this study. Predictors of use and its dimensions are weak overall, although statistically significant.

Nevertheless, several things may be said about the predictors of use of research-based information and the factors that failed to produce a significant impact. Most notably, practitioners' opinions about research-based information were the strongest predictor of use of research and the use dimensions. Although empirical studies emphasize that for practitioners to use research findings in their practice they should value research first and foremost (for instance, McNamara, 2002; Ratcliff et al., 2005; Torrence, 2002), in this study, rather neutral opinions predicted infrequent uses of research-based information. Given that attitudes and behaviours interact reciprocally, it may be that low-threshold uses of research-based information and little experience with research (only 57% of respondents reported having participated in research projects) prevent practitioners from viewing research as valuable for their own professional learning as well as that of their students.

Of the other three QURBI predictor variables, practitioners' attitudes towards awareness activities and individual expertise consistently but modestly explained the

variance across all four composite measures of research use. These results conform with the existing studies, showing that the utilization of research-based information may be increased by making research more user-friendly and by raising practitioners to the standard of research (for example, Cousins & Earl, 1995; Lafleur, 1995; William, 2002; Torrance, 2002). If the former deals with a variety of activities to facilitate transfer of research knowledge to practice, the latter directly refers to educating and to developing a plethora of skills and competencies that make practitioners efficient users of research (Cordingley, 2009; Saha et al., 1995; Torrance, 2002; Williams & Coles, 2003; Borg, 2003). Moreover, there exists an example of a successful model-in-action of a comprehensive educational system. In Finland the systematic focus on instruction and the development of professional practice has led to an increased prevalence of effective teaching methods in school: the widespread adoption of effective practices and experimentation with innovative approaches across the system (Sahlberg, 2007).

Existing research evidence argues that a combination of organizational factors, including availability of time, infrastructure and human resources; school culture and leadership; and unions and governments affect the use of research findings (for instance, Rogers, 1995; Cousins & Walker, 2000; Torrence, 2002; Englert et al., 2004; Leat et al., 2006). Contrary to their findings, organizational factors in this study were found to predict the use of research for symbolic ends, if only to justify decisions and actions. Organizational factors did not prove to be a statistically significant predictor of the use of research-based information sources. Neither did they predict instrumental or conceptual use.

Understanding why the link is non-existent is more speculative and may be gleaned from the practitioners' comments about school system predisposition to research involvement and utilization. Some practitioners argued that teaching should become a true profession where the use of research-based information is part of teachers' contracts. Therefore, they would already be engaged in fulfilling their obligations to students and would not have to use the "excuses" of time, funding, impact of unions, governmental policies or any other reasons.

Also of interest are the findings about the consistent, although weak, relationship between the variables measuring utilization of research-based information and practitioners' prior participation in research and research coursework. The existing literature emphasizes the impact of these two factors on practitioners' opinions about research (Green & Kivdahl, 1990; Cousins & Walker, 2000). It is likely that such proximity to research develops knowledge, skills, experiences and attitudes that are likely to extend beyond formal training and a specific research project into everyday teaching contexts.

It is also important to summarize findings that are at odds with the existing empirical evidence. Contrary to the previous research (Cousins & Walker, 2000; Everton et al., 2000), in this study, the association of such variables as occupational category and grade level with the use of research-based information was inconsistent and either insignificant or practically negligible. Some explanation should be given about the reason why practitioners' years of experience were unrelated to the use of research-based information. Existing empirical findings underline the negative relationships between these variables, suggesting that more experienced practitioners value research less and

consequently may use it less often because they reach a career stage where they "disinvest" in school work and have less energy and activism (Huberman, 1988; Cousins & Walker, 2000). In this study, more experience is associated with school administrators and those who previously participated in research, namely the practitioners who tend to use research somewhat more frequently than other two groups.

QURBI in the broader context. Regarding the factorial structure of the scale measuring practitioners' attitudes about research-based information and the potential predictors of use, the results clearly show that the Canada and primary school practitioner samples are comparable to the Quebec sample for which the questionnaire had been originally designed and tested. Factor analyses consistently indicated four factors: opinions about research-based information, attitudes towards activities raising awareness about research, expertise necessary to use research-based information in practice and organizational factors. The stability of factors between the samples through congruence coefficients further supports the potential transferability of the scale to larger and more diverse school practitioner populations. Internal consistency reliability coefficients as a basic psychometric property remained stable across the three samples and were well above the threshold for a satisfactory value.

Conversely, the ability of the questionnaire to predict the use of sources of research-based information varied, although it stayed within modest limits. Not only did the regression lines not coincide, but also the slopes and intercepts were significantly different, emphasizing the instability of the questionnaire in its ability to predict the use of research-based information for all three samples. Opinions about research-based information, awareness activities and individual expertise in the Canada and primary

school practitioner samples explained the use of research-based information to a considerably greater extent than did those in the Quebec sample. The relationship between the organizational factors and the use of research-based information by Quebec school practitioners was minimal or absent for the other two samples. The examination of whether predictive differences are attributable to time, questionnaire administration medium (responses collected in 2007 required response to a paper-and-pencil questionnaire, and in 2008, voluntary participation in an online questionnaire), participants' selection or provincial educational contexts demonstrated that the prediction model did not change in the two sub-samples as a function of time, survey medium or participant selection. Therefore, it might be the provincial settings that accounted for the difference in the potential of predictors to account for the use of research-based information.

Implications and Recommendations

Considering the evidence that a) non-use of research-based information from a number of sources is high and overall use of research-based information is infrequent, independent of the occupational group that school practitioners belong to; b) practitioners are neutral, if not negative, in their opinions about research-based information; and c) these opinions are the greatest predictors of all measures of use; the key implications of this study pertain mainly to school leadership organizations, teacher education institutions and research-generating bodies. The results of this research indicate that the status quo of educational research in educational practice is a structural problem requiring systemic and multivector efforts on the research and practice sides.

Therefore, performing high quality research and communicating it in a clear, user-friendly format so that it meets school practitioners' needs and speaks to their expertise within their contexts will increase the relevance and usefulness of research findings for practitioners.

The university-community engagement model can be beneficial in achieving this end. On the one hand, it enables school practitioners to communicate their interests and needs to academia. On the other hand, it includes activities for transferring knowledge to the school practitioner community and to those actors whose role is to exploit such knowledge for societal benefit. Within this participatory model of involvement, projects are not resourced by one partner for the benefit of the other, but rather all partners contribute to the project and reap mutual benefits, allowing issues of societal importance to be addressed efficiently. However, for such activities to occur, university/faculty policies for advancing researcher-community engagement and knowledge transfer activities are necessary. The integration of the knowledge transfer criterion into tenure and promotion policies is a promising practice (Benyon, 2009). Research funding agencies could also do their part in encouraging researchers to broaden their knowledge transfer activities by going beyond traditional journal publications and conference presentations.

However, these steps will not suffice: with the explosion of information, traditional methods of accumulating and transmitting research findings are inadequate. Research-based information should be readily accessible to busy practitioners and decision makers. There needs to be a "place," a public resource where educational

research-based information can be brought together and assessed for quality and relevance, that is, classified and organized for professional use. Effective structures in health and social care areas can provide methods for condensing research-based information and communicating it to education professionals.

At the same time, developing qualities and expertise of a professional research user becomes of paramount importance. More importantly, practitioners' beliefs and opinions about research should be moulded to enable them to perceive the potential of research findings for educational improvement and use research findings to inform their everyday school practice. The role that teacher education can play in laying the foundation for teaching as a research-based profession cannot be overestimated. Future teachers should be equipped with skills for finding, reading, understanding and appraising, translating and applying research findings and for isolating problems by formulating researchable questions. They should be able to initiate research at the local level to obtain a sense of ownership over the generated knowledge. This could be achieved by balancing undergraduate courses in curriculum and instruction with those that emphasize the practical value of theory and evidence. Involvement of teacher students in systematic inquiry activities should become a mandatory element of undergraduate programs. In the process of educating teachers, teacher trainers' interest in research on pedagogy in general and in their field also becomes a crucial issue. If their teaching practice is not research-based, they consciously or subconsciously communicate the idea that educational research is worthless.

Finally, for the individual practitioner's expertise and aspirations to contribute to school improvement, the school should have a built-in capacity to support the

practitioner's effort to change practice. School capacity to use research-based information should be extensive and requires re-thinking of existing structures and approaches. Such a change can be achieved by a) providing 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) integrating ongoing professional development grounded in research evidence; c) creating physical opportunities and stimulating intellectual needs for collegial networks to share experience; and d) putting in place administrative and managerial support structures for the time and energy required. The Ministry of Education and educational authorities such as school boards should have their say in helping schools build the capacity structure to use research-based information routinely. However, for these bodies to adjudicate for action, the benefits of using research-based information should be demonstrated.

Future Research

Given that non-use of research-based information is high and the uses are infrequent, this research leaves a number of areas unresolved and open for future research. First, considering the limitation of the present study, further research is necessary to gain a deeper understanding of why practitioners do not use research-based information. The issue of non-use should also be validated in other educational contexts, including higher education and lifelong learning, to examine whether attitudinal problems regarding educational research are endemic in schools only or in all educational spheres.

Second, there is a need for focussed studies to determine how practitioners who use research-based information, at least to some extent, choose what research to use, and to identify what stimulated these practitioners to use research in their practice.

The third area that is open for baseline research is the pre-service teacher education system and its mission and functions in building teaching as a research-based profession. Studies comparing research-based teacher training models (for example, the Finland model) with those effective in Canadian teacher education may be of use.

The fourth area that is open for future inquiry is research that focuses on the relationship between a variety of approaches to educational reform used across the Canadian provinces and the use of educational research in school practice. In this way, the use of research-based information should be studied both as a means and an end for educational change.

Lastly, the instrument developed to gather data for this study should be further improved. This would include further refinements to the questionnaire as well as its cross-disciplinary comparison to other professions.

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Appendices

Appendix A

Comparison of Existing Scales Measuring Use, Attitudes towards Research Findings

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
Saha, Biddle and Anderson (1995) (journal); "Attitudes towards educational research knowledge and policymaking among American and Australian school principals" *Biddle and Saha (2002)* (book chapter) "Principals, research knowledge and policy making in schools" Purpose: To study research knowledge impact	A convenient sample of 120 school principals from Australia (39) and the United States (81)	- Research knowledge acquisition: exposure to sources, evaluation of sources, knowledge acquired from sources; - Opinions regarding knowledge and innovation; - Familiarity with research knowledge: volunteered examples, recognized examples; - Use of research knowledge: volunteered topics, policy decision events, recognized topics	Respondents' environments: Background; job history, career goals, characteristics of schools (balance of students, interests groups) and school system (N of students, teachers, their qualifications)	Mixed method: Structured interviews + standardized questionnaire (35 items) Instruments pre-tested in both populations Little validity information is given	Descriptive statistics are provided (%) Correlational analysis	Little info about the types of use of research knowledge No investigation of mechanisms of knowledge dissemination to staff (teachers as important consumers of research are out of focus) Influences of settings, such as school culture and support of school board, have been ignored. Not clear why correlational analysis (the suggested model presumes linearity of connections between the links when there is none. Impact of environmental variables on opinion about research is not	Full version

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
						necessarily mediated by knowledge – source variables) is used to measure the hierarchy of relationships among variables (claimed to measure predictions). Path analysis or SEM (allows for complexity) should have been used.	
Catri, Austin, Moore (2004) (report) "Knowledge dissemination - utilization patterns of career and technical educators" Purpose: how information is spread from researchers to practitioners and how it is used by practitioners	551 respondents – teachers	Unavailable	- Sources of info (within school district) 5-point (not at all – definitely) - Seeking info from external sources; - Frequency of accessing the following sources of info (preferences of sources – ranking) assumption that it is used; - Criteria of the info	Q – based on the info from interviews and case studies; face and content validity: focus group; pilot - 6 instructors. No reliability indices	Descriptive stats (means and SDs, %) have been reported.	Use is measured as frequency of accessing certain sources of information (accessing≠use)	Full version

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
			usefulness (perceived features of info) – ranking: - Info sharing activities 4-point scale (very likely – not at all); - Impact of the info on the teaching activities (4-point scale did not change at all - changed very much); - Topics teachers need info about (4-point, no need – great need)				
Conseil supérieur de l'éducation, Bérubé (2005) (report) « L'accès à la recherche en enseignement et son utilisation dans la pratique : résultats d'une enquête auprès des enseignants et des enseignantes du préscolaire, du primaire et du secondaire. »	Random sample 548 teachers and admins from 145 primary and secondary schools in Quebec, Canada	Unavailable	- Access to research: availability of research, activities to encourage research dissemination (financial support, PD activities) 6-point importance scale; - Consultations with research products and participation in research (justify if they do not, and frequency and type if they do); - Research utilization (if they implemented new practices in the last 3 years, if they use research and what for; barriers and facilitators of the use); - Factors in the school environment (attitudes	Pilot-tested in 15 schools; Neither validity nor reliability data have been provided	% have been reported	Sample: novice teachers are over-represented while experienced teachers are under-represented. Utilization is measured on a dichotomous scale by one question.	Full version

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
			towards environment; availability of link/diffusion agents)				
Cousins and Walker (2000) (journal) "Predictors of educators' valuing of systematic inquiry in schools" Study of educator attitudes toward the conduct of inquiry, and its interrelationship with demographic and background variables	310 educators in Ontario, 3 school districts 90% teachers + 10% school admins	Educators' attitudes toward systematic inquiry in schools: - Perceived utility of systemic inquiry (general research findings) - Relevance of inquiry to practice (local + general) - Personal ability to consume and conduct evaluation and applied research (skills + attitude towards research) - Need for involvement in systemic inquiry (teachers collaborate with researchers, home research) - Need to integrate inquiry into training (attitudes toward research + TT to read and do research, EBP in Insett)	5 personal: - Teaching efficacy - Prior participation in research (? Reading research) 5-point scale from always to never - Prior research coursework: binomial scale - Experience (number of years) - Gender 2 organizational: - Organizational learning capacity (collaborative work & social processing): collegial culture, opportunity to question... - Panel/level of the school	Chronbach's alpha is presented. Large sample from School district context is adequately presented. Parts of the questionnaire have been borrowed from Green and Kivdahl (1990)	FA to operationalize the DV (latent) Inter-correlations between predictor and criterion variables, stepwise multiple regression (Betas and t-values and significance levels have been reported)	Same item in two latent factors. Not clear whether predictor variables were latent or formed via FA or composite scores. Organizational learning capacity does not include physical resources and support structure	Somew hat full version
Englert, Fries, Goodwin, Matin-Glenn, and Michel (2004) (report) "Understanding how principals use data in	121 principals across 20 districts from 7 states	Unavailable	- School policy that encouraged teachers to use data to inform instructional decision making; - Type of data use	5-point scale from low to high Administered both by mail and email. Some face validity of the instrument (details	Percentage and descriptive (means and SD) have been reported.	Data use makes only 1 section of the questionnaire Stratified random sample through	Snippet s in the paper

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
a new environment of accountability" Purpose: To generate descriptive information about: - The needs schools and districts have for effectively using data; - How schools and districts are using data to guide classroom practice; - Whether there are differences in data use based on the level of school proficiency.			(e.g., identify school instructional strengths and weaknesses); - Prerequisites to use data (e.g., guidance, training); - Availability of TD opportunities that help teachers to use data; - Availability of critical mass of teachers to develop a culture to use data to improve practices	on questionnaire design and pilot) and reliability (Ch alpha) for each section have been reported		superintendents offices mean this is convenience rather than random sample.	
Everton, Galton, and Pell (2000) (journal) "Teachers' Perspectives on Educational Research: knowledge and context" Purpose: To investigate teachers' views on research (projects that influenced them and they would like to be researched in future) and the value teachers attributed to it	302 participants of which 177 were principals and 76 deputy principals from the UK	Unavailable	- Impact of educational research; - Sources of research teachers rely upon and their usefulness; - Topics in which research influenced their teaching (the effect of the impact to improve views, to confirm and to question their views); - Priorities of topics to be researched (% have been reported) - Value of research (5-point scale)	TTA questionnaire (1998) administered as attachment to 2 in-house journals for 2 teacher organizations in UK Neither validity nor reliability data have been provided for the instrument except Ch alpha for 2 subsections of "value of research"	% as well as means have been reported, t-test for the differences in categories of teachers: primary vs secondary – significance levels reported "Value of research" statements have been FA and fell into 2 sections: "value of edu research for classroom	Conclusions are made for the teachers, although the majority of respondents were higher-level school management. Not clear what is meant by research impact (reported as teachers considering research) "Involvement in research" section should be rather "type of use" (e.g., to interpret results, prepare summaries)	Snippet s in the paper

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
					practice" and "involvement in research"		
Green and Kivdahl (1990) (AERA paper) "Research methods courses and post-bachelor education: effects on teacher research use and opinions" Purpose: Contribution of training to explain teachers' self-reported use of research in the classrooms and opinions about research	Teachers: 441 from 2 US states	- Use of research by teachers (6-point scale never to 3 + times a year) – type of use: for discussions, reviewing, trials of results, working on local problems etc, presenting, publishing - Opinions about research (6-point Likert scale); - Info on coursework and perceptions of training - Open-ended questions about: membership in prof organizations, subscription, conducted research projects.	- Degrees; - Coursework in research methods; - Gender	Reliability coefficients have been reported for each section	Reports numbers and percentages; relationship between measures in χ^2 and significance. MANOVA (all individual items) was used – 4 separate analyses	No other factors have been taken into account	Snippets in the paper
Hultman & Hörberg (1998) (journal) "Knowledge competition and personal ambition: a theoretical framework for knowledge utilization and action in context" The aim of the questionnaire – to study factors influencing research	127 teachers from primary schools (Sweden)	Unavailable	- Stress factors: no time, no ability, no support; - Obstacles to change: economy, school premises, time, pupils, teacher's own view, colleagues, parents; - Features of research (encourage utilization); - Sources of knowledge; - Important knowledge (areas of interest for	No reliability reported Face validity – based on the data from the interviews	Confidence intervals for means and t-values and significance levels for all items to show the difference between them	No association between these factors and research utilization has been established. Not clear why these factors are assumed to influence research use.	Snippets in the paper

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
utilization			teachers, e.g., how pupils learn, how to teach) - Satisfaction in work (e.g., teaching, co-operation) Scale – 5-point				
Lafleur (1995) (edited chapter) "A participatory approach to district-level program evaluation" Purpose: Perceptions of participation in the evaluation process and use of findings	Stratified sample of those who participated in previous evaluations: 24	- Utilization of program evaluation findings	- Involvement of primary users; - Commitment of staff and the superintendant; - Quality, credibility and relevance of the evaluation; - Organizational factors	69-item questionnaire, either a 7-point or 5-point Likert scale No psychometric qualities reported	Means, SDs, correlations and significance levels	Conclusions about the impact of factors cannot be made because only associations (correlations) between the variables were found. Utilization was measured by the Likert scale as a characteristic of program evaluation. Isn't it a behaviour?	Snippet s in the paper
McNamara (2002) (edited chapter) "Becoming an evidence-based practitioner : A framework for teacher-researchers" Purpose: teachers' attitudes towards doing and using	Sample: 125 teachers	- Attitudes towards research (time change – 2 years); perceived benefits of research for the school - Using research (experience and involvement in research) - Impact of research on their teaching	N/A	12-item questionnaire No psychometric qualities reported	Percentages reported only	No psychometric qualities reported	Full version

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
research							
Torrence (2002) (dissertation) "Principals' use of data: national perspective" Purpose: use of data by school principals for instructional leadership (planning, evaluations and measuring, describing and monitoring student progress)	226 of a total random sample of 460 elementary principals in the US	Principals' use of data	- Personal attitude towards data; - Instructional leadership and use of the data by others (e.g., to evaluate principals); - Self-reported competencies such as reading, interpreting, analyzing data etc; - Perceptions of self as an instructional leader; - PD opportunities (prof conferences, staff development opportunities?, university course, proofreading); - Characteristics of the school district (computer, opportunities for principals to work together, supervision by the district, expectations of the school district);	41 items, 4-point scale Chronbach's alpha is reported for internal consistency. Face and construct validity is provided for the instrument.	FA for instrument validity (empirical); multiple regression (FA scores are used)	Convenience sample misrepresented as randomized and pan-American in scope; DV section is based on the assumption that they use data and is a mix of type of use, sources and circumstances, e.g., I use data to … + type of use (e.g., to establish clear goals – instrumental and conceptual) or data sources (from classroom observations) or where (e.g., in post-observation conferences with teachers); The role of principals in research utilization is reduced to data seeking; not asked whether they create conditions for teachers	Full version

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
			- Characteristics of your school (parent support, teachers seek data or see data as assisting)			to use research/encourage them to use research	
Meadows (2008) (dissertation) "Principals' use of data in small and rural school districts of Florida" Replicated Torrence's study in small and rural districts in Florida	Sample: 164 school principals	As above	As above	As above	As above	As above	Full version
William & Coles (2003) (report) "Use of research by teachers: info literacy, access and attitudes"	Exact number not reported; response rate 10.4% Teachers (n=312), Head teachers (n=78), EduAuthority advisers (n=55), Librarians (n=250), School library services (n=49)	- Attitudes towards research; - Confidence in finding info (across info process);	- Factors associated with confidence in finding info; - Access to the sources of info (preferred formats)	24-items Variety of scales: 3-point (agree–disagree) 3-point frequency (regularly–never) dichotomous scale Neither validity nor reliability have been reported	Percentage and descriptives; Correlations with factors are described as significant (however only p values have been reported)	No psychometric value of the instrument; Use of research is associated with consulting sources of info and confidence in info-seeking skills and in finding info on a set of topics; No question was asked about the use of research or type of use; No predictive value of factors for the utilization of research by teachers. Sub-samples of librarians and school library services were not included in analyses	Full version

Study	*Sample*	*Dependent variables*	*Independent variables*	*Validity/reliability of the instrument*	*Analyses*	*Weaknesses*	*Survey availa-bility*
William & Coles (2007) (journal) "Teachers' approaches to finding and using research evidence: an information literacy perspective" Purpose: research diffusion to teachers	Stratified random sample: 312 teachers, 78 head teachers	- Attitudes toward research; - Information literacy skills (confidence level) - Access to a range of sources	- Research experience - Age - Gender - Position - Subject taught - Sector - Subject taught - Attitudes - Gender	No information available	Not clear Percentages and significance levels (chi-square?)	Low response rate: 10% for teachers; Psychometric qualities of the tool are not clear. Individual and organizational factors were not part of the questionnaire, but were gathered through interviews Did not test connection between info literacy skills and attitudes towards research	Snippets in the paper

Appendix B

List of Professional Associations Contacted for the Sample

Canadian Teachers Federation

British Columbia Teachers' Federation

Alberta Teachers' Association

Saskatchewan Teachers' Federation

Manitoba Teachers' Society

Association des enseignantes et des enseignants franco-ontariens

Elementary Teachers' Federation of Ontario

Ontario English Catholic Teachers' Association

Quebec Provincial Association of Teachers

Association des enseignantes et des enseignants francophones du Nouveau-Brunswick

New Brunswick Teachers' Association

Nova Scotia Teachers' Union

Newfoundland and Labrador Teachers' Association

Prince Edward Island Teachers' Federation

Nunavut Teachers' Association

Northwest Territories Teachers' Association

Yukon Teachers' Association

Ontario Teachers' Federation

Canadian Education Association

Canadian Association of Principals

Canadian Association of School Board Administrators

LEARN Quebec

British Columbia College of Teachers

Ontario College of Teachers

Fédération des syndicats de l'enseignement

Le centre de transfert pour la réussite éducative du Québec

Appendix C

The Proportion of Provincial School Districts and Schools

	School districts (376)	Selected school districts	Schools (13,349)	Selected schools
Alberta	60 (17.8)	17	1,417	10
British Columbia	61 (17)	17	1,634	12
Manitoba	38 (10.9)	10	687	5
New Brunswick	14 (4)	4	384	3
Newfoundland and Labrador	8 (2.3)	2	310	2
Northwestern territories	7 (2)	2	48	1
Nova Scotia	8 (2.4)	2	449	3
Nunavut	3 (.9)	1	67	1
Ontario	72 (20.7)	20	4,880	36
Prince Edward Island	3 (.9)	1	74	1
Saskatchewan	29 (8.4)	8	616	5
Quebec	72 (20.7)	20	2,755	20
Yukon	1 (.1)	1	28	1

Appendix D

Questionnaire about the Use of Research-based Information

The purpose of this questionnaire is to document the experiences and attitudes of school educators across Canada about the use of research-based information in everyday practices.

Research-based information comes from sources such as:

- scientific publications;
- government reports;
- reviews of research;
- data generated within your institution and
- evaluations of your organization.

Research-based information differs from **practice-based information.** **Practice-based information** is acquired through personal experience. This information includes one's intuition and personal perceptions based on one's own observations as well as the feedback and comments of others.

This is an anonymous survey. There is no way that your responses and comments will be traced back to you. Please remember that your participation is entirely voluntary and you are free to discontinue at any time. However, we do need your point of view on this topic. It will help us to examine and understand better how school practitioners, and the factors affecting their decision to use research. In its turn, this information will help us to construct a global portrait of research impacts on educational practices in Canadian schools.

If at any time you have questions about your rights as a research participant, please contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848 2424 x7481 or by email at areid@alcor.concordia.ca

How to answer the questionnaire

Please answer each question by filling in the circle that represents your choice.

You can choose on answer only for each question.

Fill in the circle completely WITHOUT going beyond the perimeter:

●

Do not do the following: ⊗ ⊘ ○ 

Note: **Do not use a fluorescent or felt pen.**

Use a lead pencil or a ballpoint with black or dark blue ink.

SECTION 1- General information

1. Are you male or female?

Male	Female
o	o

2. How old are you?

20 to 29 years old	30 to 39 years old	40 to 49 years old	50 years old or over
o	o	o	o

3. What is your highest degree obtained?

Pre-university	o
Undergraduate certificate	o
Undergraduate degree	o
Master's degree	o
PH.D.	o
Other (Please specify):	o

4. Have you taken prior coursework in research methods?

No prior coursework	o
Research Methods coursework taken	o
Research Methods coursework in progress	o

5. Have you participated in research projects?

No prior participation in research projects	o
Worked with University researchers	o
Worked with teachers in school projects	o

6. What is your category of employment?

Teacher	o
Principal or vice-principal	o
Administrator	o
Support staff	o
Professional staff (Please specify) :	o
Other (Please specify) :	o

→ If you are not a teacher, please go to question 8.

7. If you are a teacher, what are the main subjects, specific programs you teach?

French Language Arts	o	**Biology**	o	**Physical Sciences**	o
French as a Second Language	o	**Chemistry**	o	**Technology**	o
English Language Arts	o	**Computer Technology**	o	**Fine Art**	o
English as a Second Language	o	**Mathematics**	o	**Physical Education**	o
Geography	o	**Natural Sciences**	o	**Moral and Religious Education**	o
History and Citizenship Education	o	**Sciences and Technology**	o	**Music**	o
Other (Please specify):					

8. How long have you been working in the educational field?

0 to 3 years	4 to 7 years	8 to 11 years	12 to 15 years	16 to 19 years	20 to 23 years	24 to 27 years	Over 27 years
o	o	o	o	o	o	o	o

9. What grade level do you teach?

Primary	Secondary
o	o

10. What professional association are you a member of?

Canadian Teachers Federation	o
British Columbia Teachers' Federation	o
Alberta Teachers' Association	o
Saskatchewan Teachers' Federation	o
Manitoba Teachers' Society	o
Association des enseignantes et des enseignants franco-ontariens	o
Elementary Teachers' Federation of Ontario	o

Ontario English Catholic Teachers' Association	o
Quebec Provincial Association of Teachers	o
Association des enseignantes et des enseignants francophones du Nouveau-Brunswick	o
New Brunswick Teachers' Association	o
Nova Scotia Teachers' Union	o
Newfoundland and Labrador Teachers' Association	o
Prince Edward Island Teachers' Federation	o
Nunavut Teachers' Association	o
Northwest Territories Teachers' Association	o
Yukon Teachers' Association	o
Ontario Teachers' Federation	o
Canadian Education Association	o
Canadian Association of Principals	o
Canadian Association of School Board Administrators	o

11. What type of school do you work at?

Public	**Private**
o	o

12. Is it an alternative school?

Yes	**No**
o	o

13. What is the school size?

Small (less than 150 students)	**Medium (150-500 students)**	**Large (more than 500 students)**
o	o	o

14. What is the language of teaching at your school?

English	**French**
o	o

15. What area is your school located?

Rural Area	Urban Area	Metropolitan Area
o	o	o

16. What province/territory is the school in?

Alberta	o
British Columbia	o
Manitoba	o
New Brunswick	o
Newfoundland and Labrador	o
Northwest Territories	o
Nova Scotia	o
Nunavut	o
Ontario	o
Prince Edward Island	o
Quebec	o
Saskatchewan	o
Yukon Territory	o

SECTION 2 – Using information in your everyday practice at work

In this section we want to document the type of information you use in your everyday practice at work.

Using the following scale, rate the frequency with which you have used research-based information from the following sources during the past year...	**Never**	**1 or 2 times**	**3 or 4 times**	**5 times or more**
	1	2	3	4
17. Scholarly documents	o	o	o	o
18. Professional publications	o	o	o	o
19. Evaluations of your organization	o	o	o	o
20. Internet Web sites	o	o	o	o
21. Multimedia materials, such as video, DVD and software	o	o	o	o
22. Mass media, such as television, radio, newspapers and magazines	o	o	o	o
23. Pre-service training or university courses	o	o	o	o
24. In-service training or workshops	o	o	o	o
25. Professional conferences or presentations	o	o	o	o
26. Experts or resource people	o	o	o	o

- **Please list other sources of information you use in your everyday practice at work:**

_____

_____

_____

_____

SECTION 3 - The type of use of research-based information

In this section we want to document what for you use research-based information in your practice at work.

Using the following scale, rate the frequency with which you use research-based information to ...	**Never**	***Sometimes***	**Often**	**Always**
	1	2	3	4
27. Achieve a better understanding of issues in your practice	o	o	o	o
28. Satisfy intellectual curiosity	o	o	o	o
29. Improve your professional practice	o	o	o	o
30. Reflect on your attitudes and practices	o	o	o	o
31. Justify or validate your actions and your decisions	o	o	o	o
32. Resolve problems in your daily practice	o	o	o	o
33. Develop new activities, programs, guidelines, and materials	o	o	o	o

➢ **Please list any other type of use of research-based information:**

_____

_____

_____

SECTION 4 – Your opinion about research-based information

In this section we want to document your opinion about research-based information.

Using the following scale, rate the extent to which you personally agree that research-based information...	**Strongly disagree**		**Neutral**		**Strongly agree**
	1	2	3	4	5
34. Is easy to find	o	o	o	o	o
35. Is easy to understand	o	o	o	o	o
36. Is relevant to your reality	o	o	o	o	o
37. Offers timely information	o	o	o	o	o
38. Is reliable and trustworthy	o	o	o	o	o
39. Is useful to guide or improve your professional practice	o	o	o	o	o
40. Is easy to transfer into your practice	o	o	o	o	o

➢ **Please add any other opinions about research-based information:**

_____

_____

_____

SECTION 5 – Awareness activities

By "awareness activities" we mean methods and strategies that make practitioners aware of research findings.

Using the following scale, rate the extent to which you agree that the following activities are useful to make you aware of research-based information...	**Strongly disagree**		**Neutral**		**Strongly agree**
	1	2	3	4	5
41. Presentation of research findings tailored to your needs	o	o	o	o	o
42. Your involvement in a research project	o	o	o	o	o
43. Research results accompanied by clear and explicit recommendations	o	o	o	o	o
44. Opportunities to discuss research results with the research team	o	o	o	o	o
45. Regular contacts with people who distribute research-based information	o	o	o	o	o
46. Demonstrations about how to apply research recommendations	o	o	o	o	o
47. Discussions of research-based information with colleagues	o	o	o	o	o

➢ **Please list any other awareness activities that may be useful in your practice at work:**

_____

_____

_____

SECTION 6 – Individual expertise about the use of research-based information

By "individual expertise" we mean your skills, competence and ability to use research-based information in practice.

Using the following scale, rate the extent to which you agree that the skills listed below are useful in your practice...	**Strongly disagree** 1	2	**Neutral** 3	4	**Strongly agree** 5
48. Ability to read and understand the research publications	o	o	o	o	o
49. Skills to use information technology such as Internet, databases	o	o	o	o	o
50. Ability to assess the quality of research-based information	o	o	o	o	o
51. Expertise to translate research findings to practice	o	o	o	o	o

➢ **Please add any other skills that may be useful in your practice at work:**

_____

_____

_____

SECTION 7 – Organizational factors

By "organizational factors" we mean elements that have to be contended with in everyday life and that may affect professional activities including organizational culture such as established habits, traditions and values and physical and human resources.

Using the following scale, rate the extent to which you agree that your use of research-based information is influenced by the following organizational factors...	**Strongly disagree**		**Neutral**		**Strongly agree**
	1	2	3	4	5
52. Available time to read a journal, to apply a new technique, etc.	o	o	o	o	o
53. Available facilities and technology	o	o	o	o	o
54. Incentives, such as remuneration, honoraria, lessenii of the work-load, etc.	o	o	o	o	o
55. Opportunities to challenge established habits and traditions	o	o	o	o	o
56. Organizational importance for professional development	o	o	o	o	o
57. A supportive environment	o	o	o	o	o
58. Human resources, such as the availability of qualified staff	o	o	o	o	o
59. Organized groups, such as unions, granting agencies and media	o	o	o	o	o

- **Please list any other organizational factors that may influence your use of research-based information:**

_____

_____

We thank you for your time and participation!

Appendix E

Description of ECHO: The Canadian Council on Learning's On-line Assessment and Research System

CCL is developing an online application that enables the non-expert users to access the sophisticated analyses required to produce accurate, efficient and useful assessments of cognitive skills and attitudes.

The system allows any person with internet access the ability to visit the system website and access the system either anonymously or through a user account. Anonymous users have access to self-assessments using publicly available assessment content. Publicly available content will include assessments developed by CCL as well as assessment created and publicly released by other organizations.

Users who create a system account have access to free content as well, but will also be able to record their previous assessment data and, most importantly, be able to add organizations to their user profile. A user may add to their profile any organization who has licensed the system (licensing is free in Canada for Canadian not-for-profit organisations), by entering the organisation login ID and password, which are distributed by each organisation to its constituents.

Users associated with at least one organisation will have access to additional content and enhanced functionality. Users may also access items and assessments that are private within their organisation, and may develop items, assessments, and surveys. They may also release their content to other users, both within and outside of their organisation. When assessments and surveys are released, users have the option of

releasing them to the public at large, to users with system accounts, or only to members of their organisation (a special class of user, the 'high-stakes user' may also designate content as 'high-stakes,' which involves a greater degree of security).

When users complete assessments online, they are provided with feedback describing their strengths and weaknesses in the particular domain of assessment (or global preferences and attitudes, for affective domains), and will be directed to online resources providing additional information in these areas. For the creators of assessments, this same type of analysis is available at aggregate levels for groups of individuals (e.g., classes, schools) to identify systematic behaviour for strategic planning or population analysis. Assessment creators also have access to additional statistical analyses, including descriptives, cross-tabulations, regressions, categorical analysis, singular value decomposition (factor analysis), and cluster analysis. If additional analyses are required, or the results need to be merged with other data sets, users may download scored response matrices for their assessments and surveys for analysis in third-party software. The strength of the system lies in its application of Item Response Theory to calibrate all items used on the system and equate assessment instruments that share common items. As a result of this approach, assessments with largely different content administered to groups of different proficiency (or tendency) will produce scores that are comparable. The advantage of this feature is that local users, such as classroom teachers of small-scale 'diagnostic' researchers may use assessment instruments that provide the maximum useful information for their purposes, but the results produced by these locally-useful instruments may still be compared against external benchmarks. For monitoring

purposes, this functionality also enabled comparisons over time of results from different assessments.

Security and privacy are maintained through three separate mechanisms. The first mechanism is anonymity. CCL does not log IP addresses, and users are not required to provide any information that will allow unique identification of them given a reasonable examination of CCL's databases. Second, all intellectual property is password-protected. That means that, in order for users to access restricted content, they must provide the appropriate authentication, which is unique to each additional 'class' of content (for example, items private to an organization, or a specific assessment). Finally, all passwords are maintained and distributed by participating organisations outside of the system. That is, in order for a user to access restricted content, he or she must obtain the login information directly from his or her organisation or the creator of the content. This functionality allows all organisation-users to distribute secure online assessments and perform analyses and associate the results with specific individuals, but the real-world identification of these individuals never needs to be entered into the online system.

Appendix F

Welcome Message to Survey Participants

Welcome!

The purpose of this survey is to document the experiences and attitudes of school educators across Canada about the use of research knowledge in everyday practices. We do need your point of view on this topic. It will help us to examine and understand better both how research is used by school practitioners and the factors affecting their decision to use research. In its turn, this information will help us to construct a global portrait of research impact on educational practices in Canadian schools.

Please read these instructions carefully. **By completing the questionnaire and sending it in, you are consenting to participate in the project**, and to publication of project results. You are completely free not to participate and to discontinue at any time and at any stage of the survey. **This is an anonymous survey.** There is no way that your responses and comments will be traced back to you.

If you have concerns about the conduct of the survey please contact the researcher, Larysa Lysenko at Concordia University ((514) 848 2424 ext. 4007 or y_lysenk@education.concordia.ca). You may also contact Adela Reid, Research Ethics and Compliance Officer, Concordia University, at (514) 848 2424 ext. 7481 or by email at areid@alcor.concordia.ca.

This survey should take 10-12 minutes to complete online and must be completed in one session. You are free to skip any question that does not apply to you or you are not comfortable answering, and you are free to quit at any time. Once you have submitted

this survey you cannot change any of your data because the survey is completely anonymous. Your responses will be stored in a secure location.

If you prefer to fill this survey out by hand, you may download and print a PDF copy of the survey here. To do so, you will need the Adobe Reader software, which can be downloaded for free at XXX. Please send the completed survey to: Larysa Lysenko, CSLP, Concordia University, LB-581, 1400 De Maisonneuve Blvd. West, Montreal, Quebec H3G 2V8. Otherwise, if these instructions are clear and you agree to participate, please click Next to begin the online version.

Appendix G

Invitation to Participate in an Online Survey about the Use of Research-based Information in Professional Practice

Dear colleague,

We are inviting you to participate in an online survey, which has been designed to document the experiences and attitudes of school educators across Canada about how research knowledge is used in everyday practices. We need your point of view on this topic – even (and especially) if you feel that available research findings are not particularly useful to your teaching. Your responses will help us to examine and better understand how research is used by school practitioners, and the factors affecting the decision to use the results of research in practice. Understanding this will help us 1) estimate the impact of current research on instructional practices, and 2) devise strategies that researchers can use to communicate results of research more effectively to practitioners.

This is an anonymous survey. To take part, simply access and complete the online questionnaire at the following URL: xxxxxxxxxx before December 15, 2008. This questionnaire is also available in French at: xxxxxxxxxx.

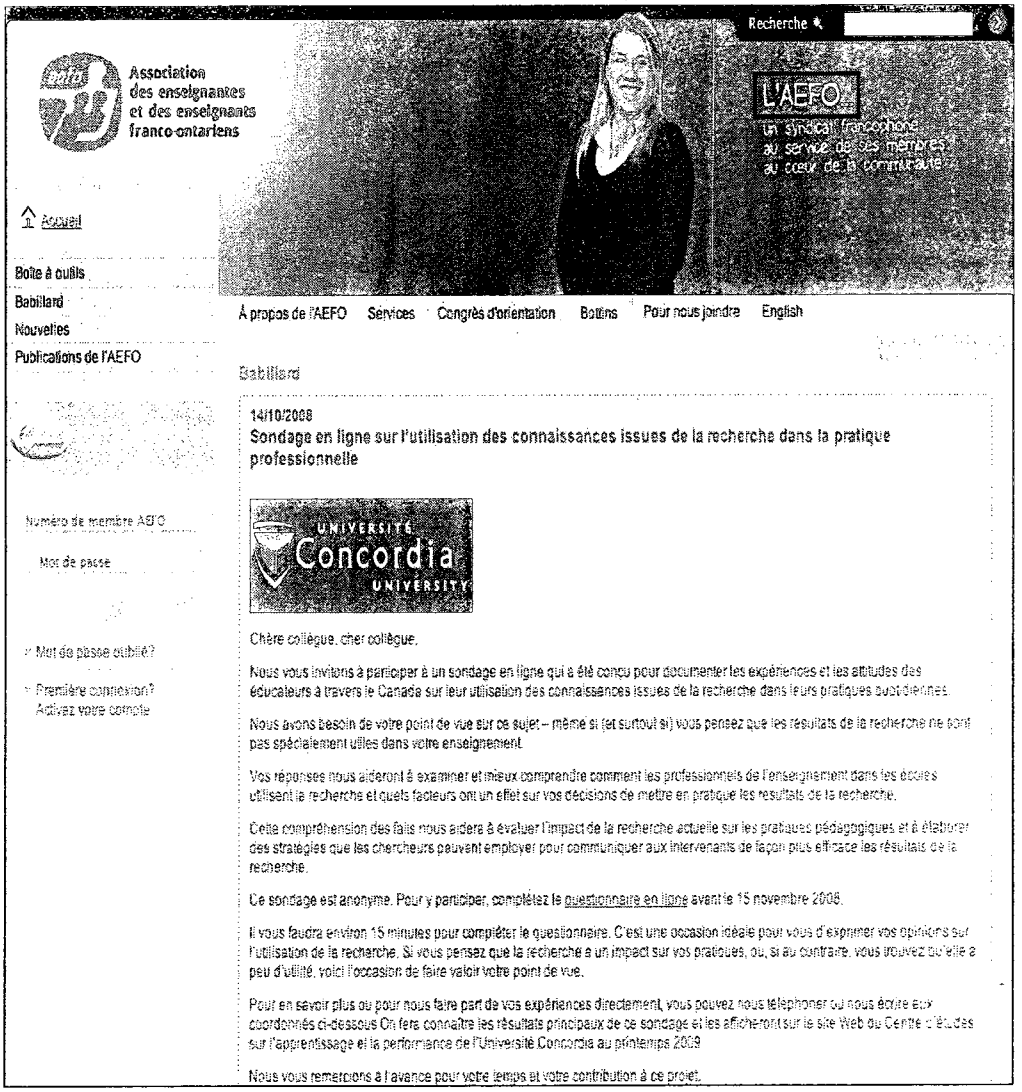
Filling out the form should take you 10-12 minutes. This is an ideal occasion for you to express your opinions about the use of research. If you feel that research knowledge affects your practices or, on the contrary, is of little use, here is a way of making your views known.

To obtain further information or tell us about your experience directly, phone or write to us. The results of the survey will be made public and presented on the XYZ Web site in spring 2009 of what you will be additionally informed.

Thank you!

Appendix H

Strategies Used by Associations to Promote the Study



-----Original Message-----
From: Marie Schutt
Sent: Tuesday, October 14, 2008 7:55 AM
To: Joycelyn Fournier-Gawryluk; Les
Dukowski; Maria Di Perna;
Michael Knowles; Shawn Larson; Terry Young; Adriaensen, Martine; Bill Tucker;
Eelee Higgins; Eric Estabrooks; Garnet Goertzen; James Jelinski;
janette_vlanich; Jim Jordan; Joan Duckitt; Laura Hodgins; Marilyn Merler; Theodore.Hupe
Subject: Pan-Canadian online study of research utilization

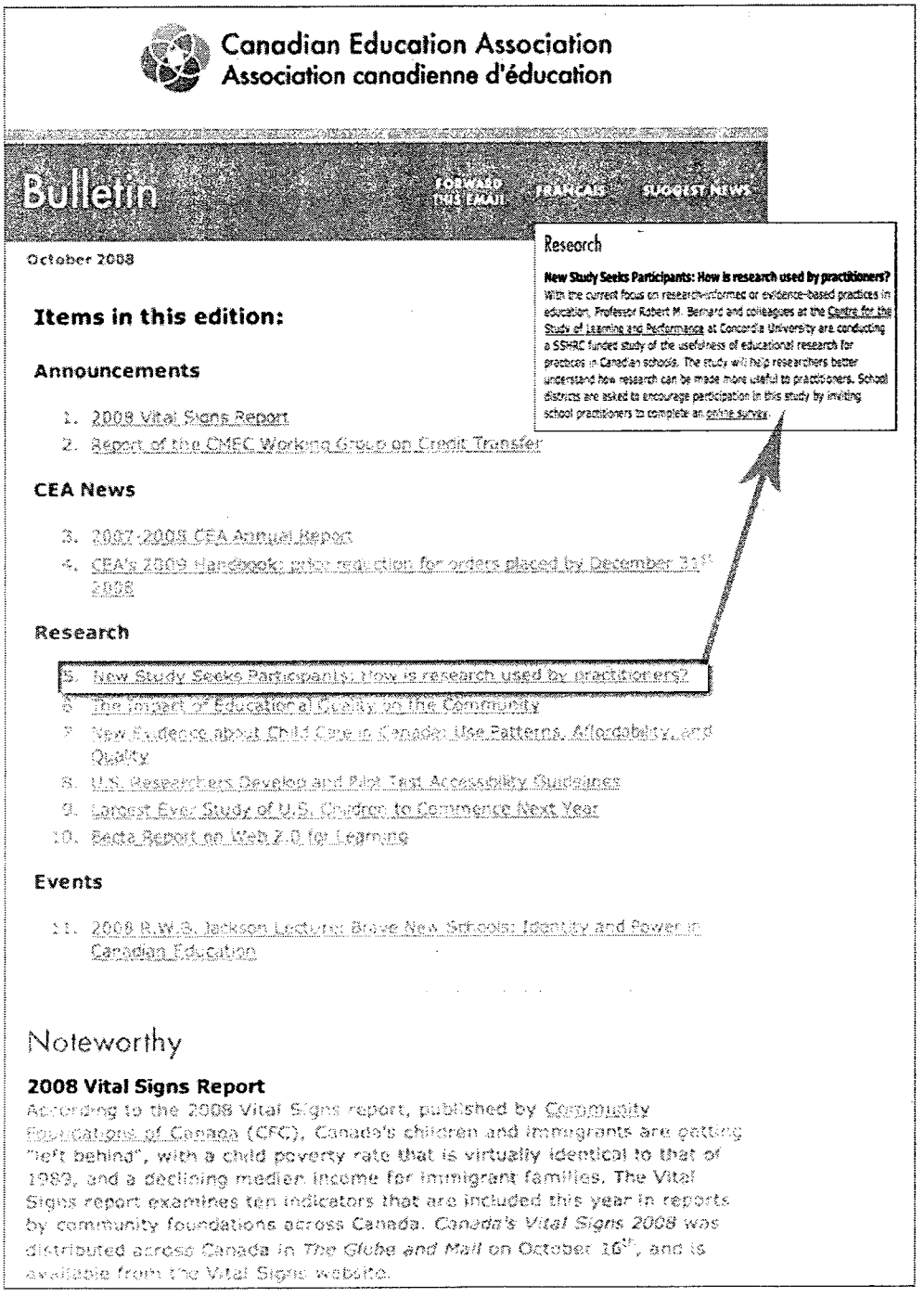
Dear CAP Directors,

We have received the following request from Concordia University, who we have supported on several projects in the past. It is at your discretion that you share the below link and ask your membership to complete the online survey (before November 15) about the use of research findings in school practices.

Here is the URL to the English version:
http://echoonline.cci-cca.ca/Default.aspx?release=010edbbd-b2do-4f53-9f7c-a164f5838d63
and French version:
http://echoonline.cci-cca.ca/Default.aspx?release=90d267b7-d0df-49b3-bf69-b902ddea821e

Regards,
Marie

Marie Schutt, Executive Assistant
Canadian Association of Principals
300 Earl Grey Drive, Suite 220
Kanata, ON K2T 1C1
Telephone: 613.622.0346



Canadian Education Association
Association canadienne d'éducation

Bulletin

FORWARD THIS EMAIL · FRANÇAIS · SUGGEST NEWS

October 2008

Items in this edition:

Announcements

1. 2008 Vital Signs Report
2. Report of the CMEC Working Group on Credit Transfer

CEA News

3. 2007-2008 CEA Annual Report
4. CEA's 2009 Handbook: price reduction for orders placed by December 31st 2008

Research

5. New Study Seeks Participants: How is research used by practitioners?
6. The Impact of Educational Quality on the Community
7. New Evidence about Child Care in Canada: Use Patterns, Affordability, and Quality
8. U.S. Researchers Develop and Pilot Test Accessibility Guidelines
9. Largest Ever Study of U.S. Children to Commence Next Year
10. Becta Report on Web 2.0 for Learning

Events

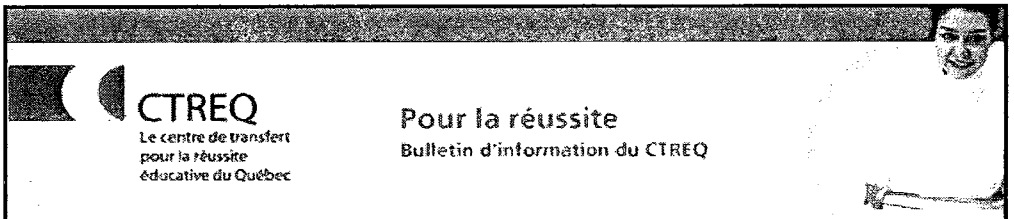
11. 2008 R.W.B. Jackson Lecture: Brave New Schools: Identity and Power in Canadian Education

Research

New Study Seeks Participants: How is research used by practitioners?
With the current focus on research-informed or evidence-based practices in education, Professor Robert M. Bernard and colleagues at the Centre for the Study of Learning and Performance at Concordia University are conducting a SSHRC funded study of the usefulness of educational research for practices in Canadian schools. The study will help researchers better understand how research can be made more useful to practitioners. School districts are asked to encourage participation in this study by inviting school practitioners to complete an online survey.

Noteworthy

2008 Vital Signs Report
According to the 2008 Vital Signs report, published by Community Foundations of Canada (CFC), Canada's children and immigrants are getting "left behind", with a child poverty rate that is virtually identical to that of 1989, and a declining median income for immigrant families. The Vital Signs report examines ten indicators that are included this year in reports by community foundations across Canada. *Canada's Vital Signs 2008* was distributed across Canada in *The Globe and Mail* on October 16th, and is available from the Vital Signs website.



CTREQ
Le centre de transfert pour la réussite éducative du Québec

Pour la réussite
Bulletin d'information du CTREQ

Info-CTREQ - Vol. 3, no 7

Pour se désabonner
Communiquez avec la rédaction
Consultez la version en ligne

COMMUNIQUÉS

2008-11-26

Nouveau produit en ligne : l'Inventaire visuel d'intérêts professionnels est maintenant disponible dans REPÈRES

Mieux connu sous le nom de ***IVIP***, l'Inventaire visuel d'intérêts professionnels est maintenant disponible dans le système REPÈRES de la Société GRICS.

[suite]

2008-11-05

Participants recherchés pour une nouvelle étude : comment les professionnels de l'enseignement utilisent-ils la recherche?

Le Centre d'études sur l'apprentissage et la performance (CEAP) de l'Université Concordia invite le personnel scolaire (enseignant, professionnel) à consacrer quelques minutes de leur temps à une recherche sur l'éducation.

[suite]

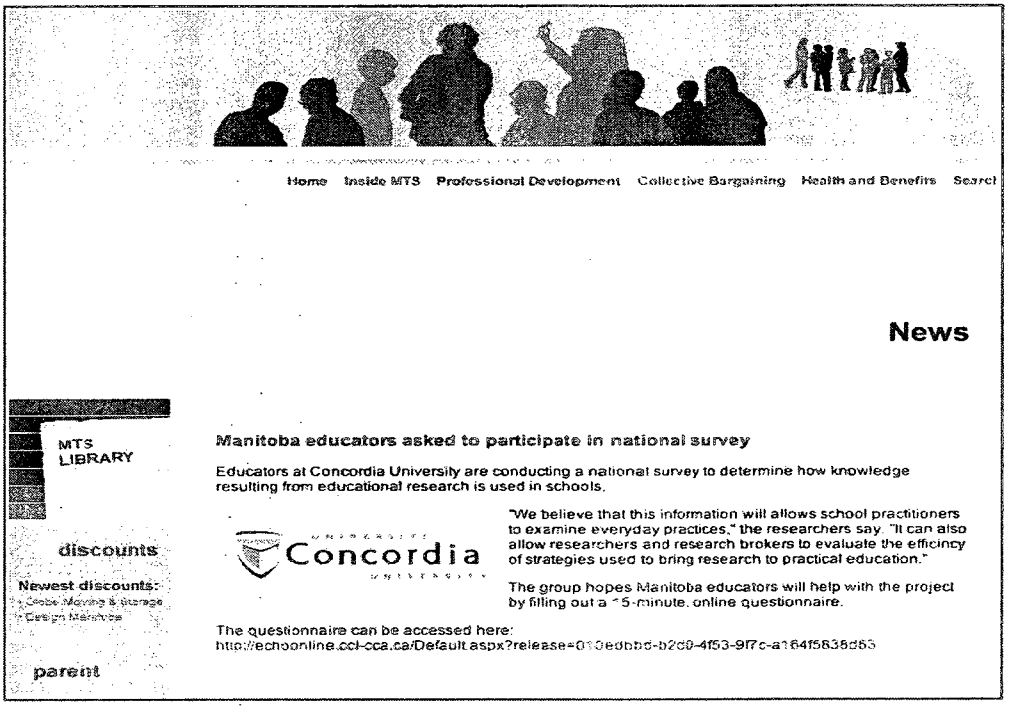
2008-11-21

Nouveau projet : le CTREQ annonce la mise en chantier de Clicmathématique

Le CTREQ est heureux d'annoncer la mise en œuvre d'un nouveau projet d'apprentissage en ligne des mathématiques destiné aux clientèles peu scolarisées, inscrites par exemple dans le nouveau Parcours de formation axée sur l'emploi du MELS.

[suite]

1175, avenue Lavigerie, Place Iberville Deux, bureau 440, Québec (Québec) G1V 4P1 info@ctreq.qc.ca
Téléphone : (418) 658-2332 Télécopieur : (418) 658-2009



Home Inside MTS Professional Development Collective Bargaining Health and Benefits Searcl

News

MTS LIBRARY

discounts

Newest discounts:

parent

Manitoba educators asked to participate in national survey

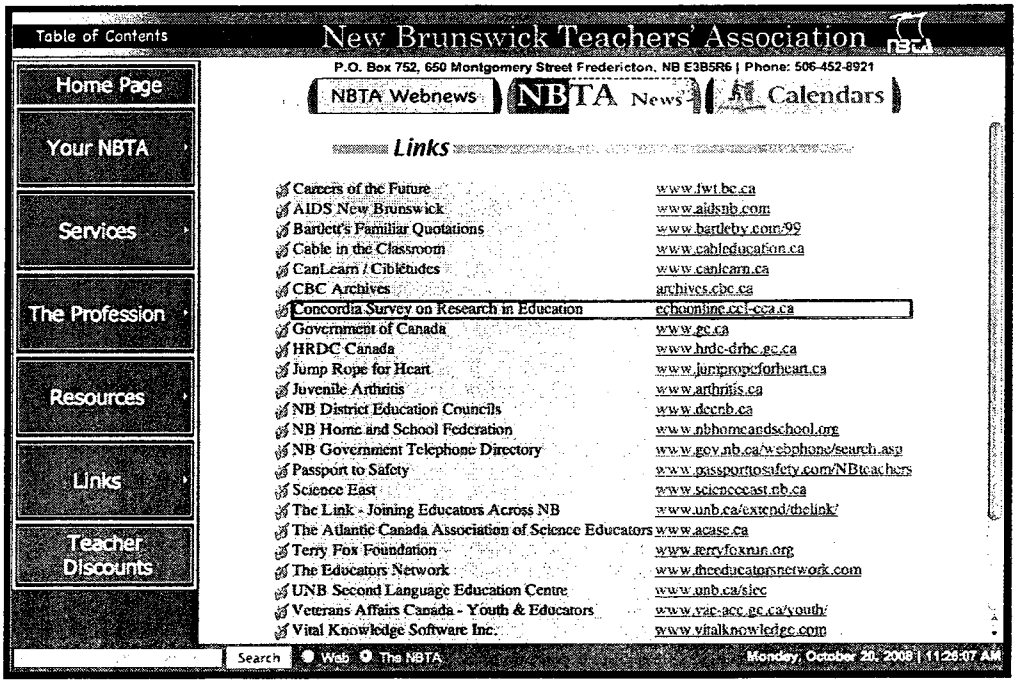
Educators at Concordia University are conducting a national survey to determine how knowledge resulting from educational research is used in schools.

Concordia

"We believe that this information will allows school practitioners to examine everyday practices," the researchers say. "It can also allow researchers and research brokers to evaluate the efficincy of strategies used to bring research to practical education."

The group hopes Manitoba educators will help with the project by filling out a 15-minute, online questionnaire.

The questionnaire can be accessed here:
http://echoonline.ccl-cca.ca/Default.aspx?release=



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New Brunswick Teachers' Association

P.O. Box 752, 650 Montgomery Street Fredericton, NB E3B5R6 | Phone: 506-452-8921

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The Profession
Resources
Links
Teacher Discounts

Links

Careers of the Future	www.fwt.bc.ca
AIDS New Brunswick	www.aidsnb.com
Bartlett's Familiar Quotations	www.bartleby.com/99
Cable in the Classroom	www.cableducation.ca
CanLearn / Ciblétudes	www.canlearn.ca
CBC Archives	archives.cbc.ca
Concordia Survey on Research in Education	echoonline.ccl-cca.ca
Government of Canada	www.gc.ca
HRDC Canada	www.hrdc-drhc.gc.ca
Jump Rope for Heart	www.jumpropeforheart.ca
Juvenile Arthritis	www.arthritis.ca
NB District Education Councils	www.decnb.ca
NB Home and School Federation	www.nbhomeandschool.org
NB Government Telephone Directory	www.gov.nb.ca/webphone/search.asp
Passport to Safety	www.passporttosafety.com/NBteachers
Science East	www.scienceeast.nb.ca
The Link - Joining Educators Across NB	www.unb.ca/extend/thelink/
The Atlantic Canada Association of Science Educators	www.acase.ca
Terry Fox Foundation	www.terryfoxrun.org
The Educators Network	www.theeducatorsnetwork.com
UNB Second Language Education Centre	www.unb.ca/slec
Veterans Affairs Canada - Youth & Educators	www.vac-acc.gc.ca/youth/
Vital Knowledge Software Inc.	www.vitalknowledge.com

Search | Web | The NBTA | Monday, October 20, 2008 | 11:20:07 AM

NOTICES

Call for volunteers for the SPCA

The Nova Scotia SPCA (Society for the Prevention and Cruelty to Animals) is looking for volunteers to help develop curriculum material and teacher/school kits to teach children about respect for animals, dog bite prevention, etc. If you are interested, please contact Mary Hill, Nova Scotia SPCA, Board Member & Chair of Education Committee, Halifax, NS at maryhill1628@hotmail.com or 902-454-8413.

Peaceful Schools International's Sam and the Goodwill Sandwich

Peaceful Schools International (PSI) is raising funds for *Sam and the Goodwill Sandwich*. *Sam and the Goodwill Sandwich* is a children's book which was written to give teachers an academic tool to build reading and writing skills, while planting the seeds of pro-social thought in the minds of their students. While the story could be read simply for entertainment or social skill-building, the lesson plan included can be used to reinforce a variety of academic benchmarks.

The title refers to the technique of engaging another person as an ally in problem-solving or conflict resolution by wrapping the issue in a given conflict with a covering of articulated personal goodwill. By students making it clear that a positive relationship with the person is just as important as a positive outcome to the problem, there is a greater chance the other person will join the problem as a friend, and not as an adversary.

PSI would like to be able to print and distribute at no charge, copies of the book to hospitals and other organizations that offer support to families. Although PSI has been successful in obtaining a few donations, more is needed to cover the printing costs.

If you wish to donate, contact Henry van Gurp, PSI President at hvangurp@mail.com. PSI is very happy to share the book in its pdf version with anyone interested. The book is downloadable in pdf version by visiting http://peacefulschoolsinternational.org/smf/index.php?topic=549.msg1288.

The Centre for the Study of Learning and Performance online Survey

PARTICIPATE BY NOVEMBER 15

The Centre for the Study of Learning and Performance (CSLP) at Concordia University is looking for participants for an online survey about the use of research-based information in professional practice. Your viewpoints on this topic—even (and especially) if you feel that available research findings are not particularly useful to your teaching—are needed. Responses will help the CSLP examine and better understand how school practitioners use research, and what factors affect decisions to use the results of research in practice. Understanding this will help estimate the impact of current research on instructional practices, and devise strategies that researchers can use to communicate results of research more effectively to practitioners.

This is an anonymous survey. To participate, simply access and complete the online questionnaire before November 15, 2008 at http://echoonline.ccl-cca.ca/Default.aspx?release=010edbbd-b2d0-4f53-917e-a164f58385d63.

If you feel that research knowledge affects your practices or, on the contrary, is of little use, here is a way of making your views known.

To obtain further information, or tell the Centre about your experience directly, contact Dr. Robert M. Bernard, Research Project Leader, Professor of Education, CSLP/Education, S-LB-581, Concordia University, 1455 de Maisonneuve blvd West Montreal, QC, H3G 1M8; Tel. (514) 848 2424 ext 2027, email: bernard@education.concordia.ca or visit the website: http://doe.concordia.ca/cslp.

The main findings from this survey will be made public and presented on the website of the Centre for the Study of Learning and Performance, at Concordia University, in spring 2009.

Call for submissions Museums and Schools Partnership Award

DEADLINE IS NOVEMBER 15, 2008

The purpose of the 2008-2009 Museums and Schools Partnership Award is to recognize excellence in collaboration between Canadian museums and schools in developing educational programming to enrich and expand students' understanding of and appreciation for Canada's cultural and natural heritage. The Museums and Schools Partnership Award is co-sponsored by the Canadian College of Teachers and the Canadian Teachers' Federation in collaboration with the Canadian Museums Association (CMA).

The award is open to any Canadian school or school board in collaboration with any Canadian public non-profit museum (including closely related institutions such as zoos and science centers) or museum group, with the exception of institutions employing members of the awards committee.

The submission deadline is November 15, 2008. Award recipients will be honoured at the CMA National conference in Toronto, in March 2009.

For more information about this award and to download the award application form, please visit the CMA website at: http://www.museums.ca/en/about_cma/awards/museums_and_schools_partnership_award/index.php.

A&E Canadian Classroom's 2008 Essay Contest

DEADLINE DECEMBER 15, 2008

Students in Grades 5-12 are invited to enter A&E's 'LIVES THAT MAKE A DIFFERENCE' ESSAY CONTEST (formerly the 'BIOGRAPHY® OF THE YEAR ESSAY CONTEST') by writing and submitting an original essay in 300 words or less on who they think made the greatest impact on Canadian society in 2008.

Each entry must include the student's name, complete address, postal code, telephone number, age, grade, name of teacher, school, school address, and local cable system (if known). Don't Delay! Send entries to: LIVES THAT MAKE A DIFFERENCE ESSAY CONTEST, c/o Temple Scott Associates, 250 The Esplanade, Suite 301, Toronto, Ontario M5A 1J2. The deadline is December 15, 2008. Two winners from each grade level — 5th-8th grade and 9th-12th grade — will be selected.

For complete details and official contest rules, go to the A&E Canadian Classroom website at http://www.biography.com/classroom/canadianclassroom.jsp.

Hackmatack Registration Open. Get Ready to Read!

The Hackmatack Children's Choice Book Award is now accepting registrants for its 2008-2009 program. Whether through their school, public library or as individuals, students in Grades 4 through 6 are encouraged to register in this exciting reading program which introduces new and enticing Canadian books to young readers. Both fiction and non-fiction, English and French—there is something here for every reading taste. In the spring, registered readers get to vote for their favourite books, have authors visit their schools and libraries, and perhaps attend May's gala award ceremony in Halifax where results of the children's votes are announced.

The Hackmatack Award—whose name comes from the Mi'kmaq word for tamarack or larch tree—is now in its tenth year. The Hackmatack Children's Choice Book Award is a literary program designed to promote and advance reading and literacy among school-aged children in Atlantic Canada, foster the development and appreciation of writing in Atlantic Canada, and encourage a greater public recognition of the work of Canadian writers.

Ten books are chosen in each of four categories—French fiction and non-fiction, and English fiction and non-fiction. The 40 short-listed books cover a wide range of reading abilities, themes, and cultures. Groups who register receive a kit—including information on each author and book, tally sheets and voting forms, certificates and clip-art—produced to aid teachers or facilitators in presenting the program to students. The Nova Scotia Department of Education provides a set of books to every elementary school in the province. In addition, sets can be purchased at selected bookstores in each Atlantic province.

The deadline for registration for this year's Hackmatack Award is December 31, 2008. For more information, registration procedures and fees, and a downloadable program kit, visit the Hackmatack website: www.hackmatack.ca.

DIRECTIONS Council for Vocational Services Society

DIRECTIONS Council for Vocational Services Society is a not for profit organization representing 28 member agencies throughout Nova Scotia, from Glace Bay to Yarmouth. The Council's mandate is to assist and support member organizations in the delivery of services that promote the abilities and inclusion of persons with disabilities in the everyday activities of their community. DIRECTIONS member agencies employ approximately 300 staff that provide program services for 1,900 participants within the province.

Many of the universities and community colleges are marketing their programs for prospective students, but, unfortunately, the post-secondary options available for students with an intellectual disability graduating from high school are limited. We are interested in proposing training for the educators of these students to give them an opportunity to learn more about successful school to community transition planning.

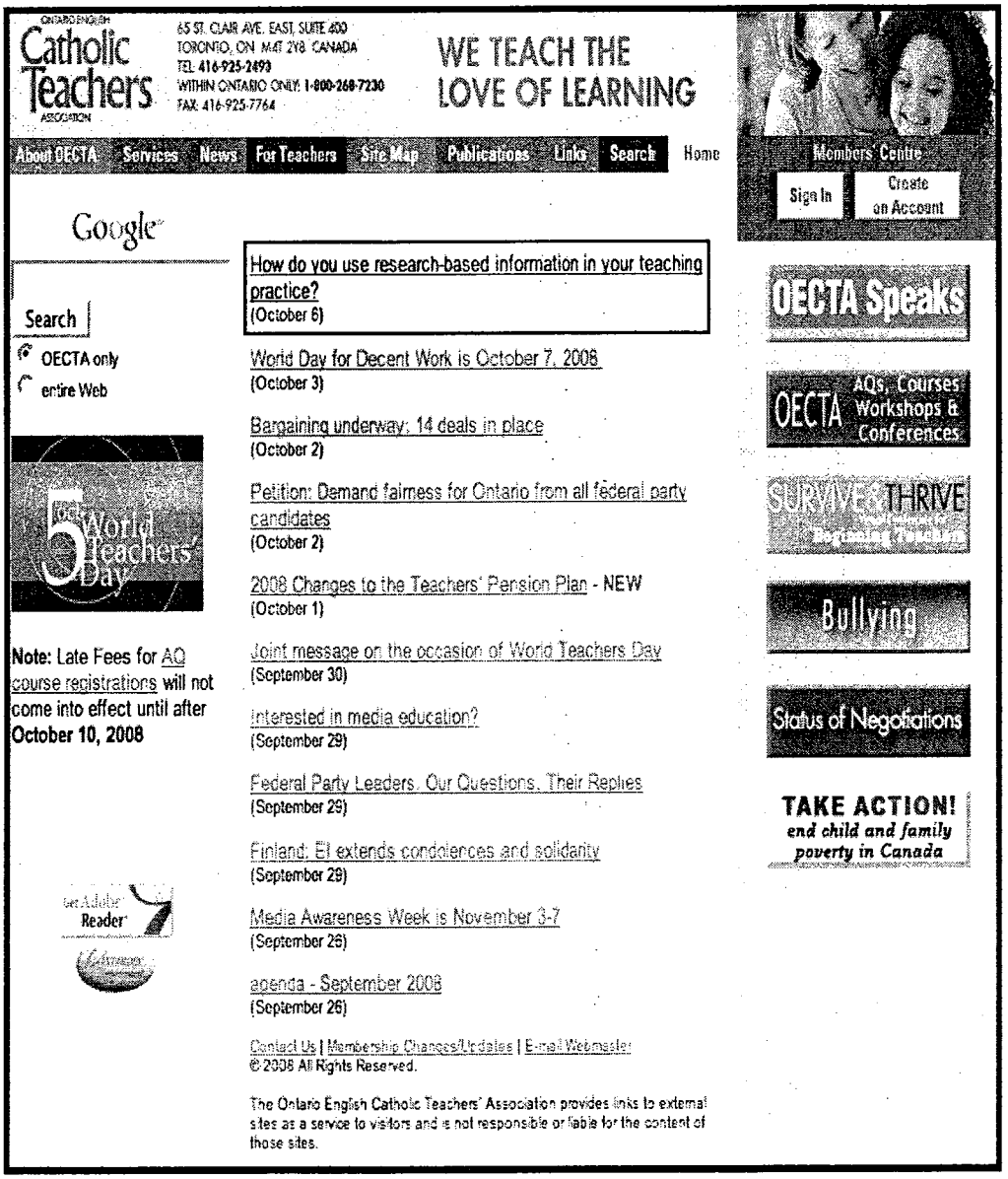
For further information please visit our website at www.directionscouncil.org or contact Cheryl @ 902-466-2220.

NOVA SCOTIA TEACHERS UNION COMMITTEES — UPDATE

Public Affairs Committee Chair Appointment *(Appointed - October 2008)*

E. Sandra Mitchell (Lunenburg County) appointed as new chair

Educational Leave Committee *(Appointed - October 2008)*
(Article 20 - Community College - Professional Support)


Ontario English Catholic Teachers Association
65 ST. CLAIR AVE. EAST, SUITE 400
TORONTO, ON M4T 2Y8 CANADA
TEL 416-925-2493
WITHIN ONTARIO ONLY: 1-800-268-7230
FAX 416-925-7764
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How do you use research-based information in your teaching practice?
(October 6)
World Day for Decent Work is October 7, 2008
(October 3)
Bargaining underway; 14 deals in place
(October 2)
Petition: Demand fairness for Ontario from all federal party candidates
(October 2)
2008 Changes to the Teachers' Pension Plan - NEW
(October 1)
Joint message on the occasion of World Teachers Day
(September 30)
Interested in media education?
(September 29)
Federal Party Leaders: Our Questions, Their Replies
(September 29)
Finland: EI extends condolences and solidarity
(September 29)
Media Awareness Week is November 3-7
(September 26)
agenda - September 2008
(September 26)
OECTA Speaks
OECTA AQs, Courses, Workshops & Conferences
SURVIVE & THRIVE
Bullying
Status of Negotiations
TAKE ACTION!
end child and family poverty in Canada
Note: Late Fees for AQ course registrations will not come into effect until after October 10, 2008
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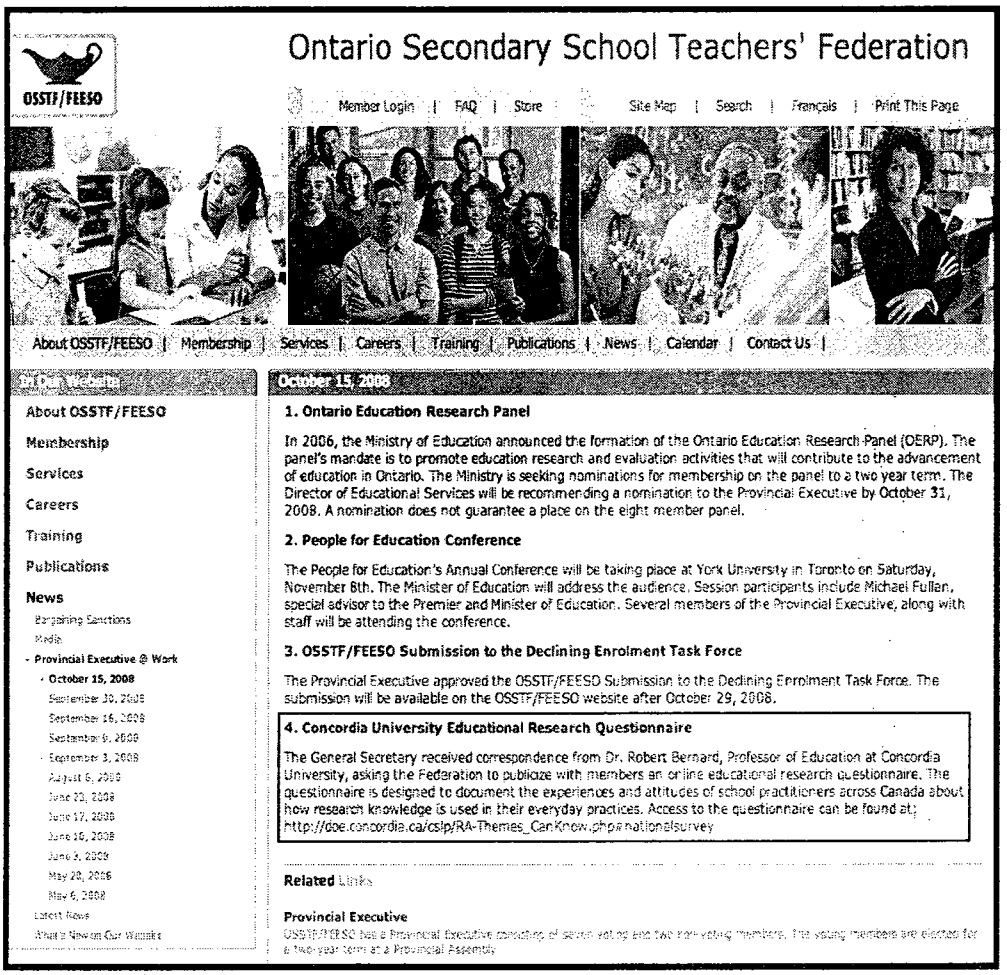
The Ontario English Catholic Teachers' Association provides links to external sites as a service to visitors and is not responsible or liable for the content of those sites.



OSSTF/FEESO

Ontario Secondary School Teachers' Federation

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  - June 16, 2008
  - June 3, 2008
  - May 20, 2008
  - May 6, 2008

Latest News

What's New on Our Website

October 15, 2008

1. Ontario Education Research Panel

In 2006, the Ministry of Education announced the formation of the Ontario Education Research Panel (OERP). The panel's mandate is to promote education research and evaluation activities that will contribute to the advancement of education in Ontario. The Ministry is seeking nominations for membership on the panel to a two year term. The Director of Educational Services will be recommending a nomination to the Provincial Executive by October 31, 2008. A nomination does not guarantee a place on the eight member panel.

2. People for Education Conference

The People for Education's Annual Conference will be taking place at York University in Toronto on Saturday, November 8th. The Minister of Education will address the audience. Session participants include Michael Fullan, special advisor to the Premier and Minister of Education. Several members of the Provincial Executive, along with staff will be attending the conference.

3. OSSTF/FEESO Submission to the Declining Enrolment Task Force

The Provincial Executive approved the OSSTF/FEESO Submission to the Declining Enrolment Task Force. The submission will be available on the OSSTF/FEESO website after October 29, 2008.

4. Concordia University Educational Research Questionnaire

The General Secretary received correspondence from Dr. Robert Bernard, Professor of Education at Concordia University, asking the Federation to publicize with members an online educational research questionnaire. The questionnaire is designed to document the experiences and attitudes of school practitioners across Canada about how research knowledge is used in their everyday practices. Access to the questionnaire can be found at: http://doe.concordia.ca/cslp/RA-Themes_CanKnow.php#nationalsurvey

Related Links

Provincial Executive

OSSTF/FEESO has a Provincial Executive consisting of seven voting and two non-voting members. The voting members are elected for a two-year term at a Provincial Assembly.

PEITF Summary

Prince Edward Island Teachers' Federation

October 14, 2008 **Issue #3**

2e Symposium de l'Atlantique
La réussite des élèves en milieu minoritaire francophone: une résponsabilité partagée

les 6 et 7 novembre 2008, Holiday Inn Express, Moncton (Nouveau-Brunswick)

L'AEFNB, en collaboration avec la Newfoundland and Labrador Teachers' Association (NLTA), la Nova Scotia Teachers Union (NSTU) et la Prince Edward Island Teachers' Federation (PEITF), vous lance une invitation à participer au deuxième symposium regroupant les associations des enseignantes et des enseignants des provinces de l'Atlantique. Les attentes de ce symposium visent à favoriser les discussions et les échanges entre les partenaires du monde de l'éducation sur des préoccupations communes touchant les minorités francophones de la région atlantique, tout en plaçant l'emphase sur le partage des pistes de solution gagnantes qui permettent la réussite des élèves en milieu minoritaire.

Pour de plus amples informations ou pour vous procurer le formulaire d'inscription, veuillez communiquer avec Bob MacRae, 569-4157, 1-800-903-4157.

Invitation to participate in an online survey about the use of research-based information in professional practice

Concordia University invites teachers to participate in an online survey, which has been designed to document the experiences and attitudes of school practitioners across Canada about how research knowledge is used in their everyday practices. We need your point of view on this topic – even (and especially) if you feel that available research findings are not particularly useful to your teaching. Your responses will help us to examine and better understand how research is used by school practitioners, and the factors affecting your decision to use the results of research in practice. Understanding this will help us 1) estimate the impact of current research on instructional practices, and 2) devise strategies that researchers can use to communicate results of research more effectively to practitioners. This is an anonymous survey. To participate, simply access and complete the online questionnaire before November 15, 2008 at the below link or through the URL.

CLICK HERE TO BEGIN

http://echoonline.ccl-cca.ca/Default.aspx?release=010edbbd-b2d0-4f53-9f7c-a164f5838d63

Filling out the form should take you about 15 minutes. This is an ideal occasion for you to express your opinions about the use of research. If you feel that research knowledge affects your practices or, on the contrary, is of little use, here is a way of making your views known. To obtain further information, or tell us about your experience directly, feel free to phone or write to us at the below coordinates. The main findings from this survey will be made public and presented on the web site of the Centre for the Study of Learning and Performance, at Concordia University, in spring 2009. We appreciate in advance your time and contribution!

Dr. Robert M. Bernard, Research Project Leader, Professor of Education, CSLP/Education, S-LB-581

Concordia University, 1455 de Maisonneuve blvd West, Montreal, QC, H3G 1M8, Tel. (514) 848 2424 ext 2027, Email: bernard@education.concordia.ca Website: http://doe.concordia.ca/cslp

Subject: Re: Fw: Pan-Canadian online study on research utilization

To: LARYSA LYSENKO

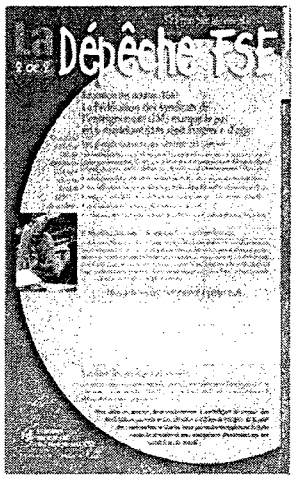
Cc:

Comic Sans MS 12 Left Insert... Format...

"Serge Laurendeau" <serge_laurendeau@qpat-apeq.qc.ca> writes:
Dear Mrs Lysenko,
I have received your e-mail and the letter from professor Robert M. Bernard
but unfortunately the deadline for our Liaison publication which goes to all
our schools is passed . Instead, I have sent the following memo to all the
Union presidents to disseminate the information regarding the online survey.
QPAT would be pleased to receive the study findings from your research.
Sincerely
Serge Laurendeau
----- Original Message -----
From: "Barbara McHarg"
To: "Serge Laurendeau"; "Michel Gagnon"
; susan tremblay;
<ruth@mta; "John Winrow"; "Joanne Jones"
; "Gordon Dell"; "Brian Giffin"; "Bev Miller"
Sent: Tuesday, September 30, 2008 10:39 AM
Subject: Fw: Pan-Canadian online study on research utilization

> Dear President,
>
> Please feel free to encourage your teachers to participate in this
> Concordia
> Online Research. The study is about the use of research - based
> information
> in the everyday practices. You will find more information and the link to
> the survey below.
Here are the URLs to the French version of the questionnaire:
>>> http://echoonline.ccl-cca.ca/Default.aspx?release=90d267b7-d0df-49b3-bf69-b902ddea821e
>>>
>>> and to the English version of it:
>>> http://echoonline.ccl-cca.ca/Default.aspx?release=01Ocdbbd-b2d0-4f53-9f7c-a164f5838d63
>
> Serge
>
>
>
> ----- Original Message -----
> From: "Serge Laurendeau" <serge_laurendeau@qpat-apeq.qc.ca>
> To: "Barbara McHarg" <barbara_mcharg@qpat-apeq.qc.ca>
> Sent: Tuesday, September 30, 2008 10:31 AM
> Subject: Fw: Pan-Canadian online study on research utilization

La Dépêche FSE



Sondage sur l'utilisation des connaissances issues de la recherche dans la pratique professionnelle

Le Centre d'études sur l'apprentissage et la performance (CEAP), rattaché à l'Université Concordia oeuvre dans le domaine de l'éducation, sur des enjeux liés à l'amélioration de la contribution de l'éducation au Canada au développement de l'économie du savoir. Les chercheurs mènent actuellement une enquête afin de connaître comment les connaissances, générées par la recherche en éducation, sont appliquées dans la pratique pédagogique. L'objectif est d'évaluer l'efficacité des stratégies employées pour amener la recherche dans la pratique pédagogique.

Le CEAP a conçu un questionnaire en ligne qui vise à documenter les expériences et les attitudes des enseignantes et enseignants à travers le Canada sur leur utilisation des connaissances scientifiques dans leurs pratiques quotidiennes et les facteurs qui influencent leurs décisions de mettre en pratique les résultats de la recherche

Plate-forme électorale de la FSE (CSQ) : Faire de l'éducation une priorité nationale

- Financer adéquatement l'éducation publique.
- S'assurer que l'intégration des élèves en difficulté dans les classes régulières réponde aux besoins de ceux-ci, tout en garantissant le niveau de services requis pour les intégrer, et qu'elle n'occasionne ni contrainte excessive à l'organisation de la classe ni ne porte atteinte aux droits des autres élèves.
- Réduire significativement le nombre d'élèves par classe, autant au secteur des jeunes qu'à celui des adultes.
- Revoir la politique d'évaluation des apprentissages pour que l'évaluation et les tâches qui en découlent soient ramenées à des proportions plus réalistes et permettent d'évaluer réellement le contenu du programme enseigné.
- Poursuivre la réforme de la réforme, notamment en précisant le niveau de progression des connaissances attendu des élèves pour l'ensemble des programmes et pour chacune des années scolaires.
- Maintenir le moratoire au sujet de l'implantation de la réforme à l'éducation des adultes, tant et aussi longtemps que les conditions nécessaires à sa réussite ne seront pas réunies.
- Reconnaître à la formation professionnelle les outils et le financement nécessaires afin d'offrir des formations qualifiantes et transférables pour répondre adéquatement aux besoins de main-d'œuvre qualifiée.
- S'assurer d'un climat propice à l'apprentissage, exempt de violence et empreint de respect.
- Reconnaître l'expertise du personnel enseignant dans la prise de décision affectant la vie des établissements et lors de l'élaboration des politiques ministérielles.
- Reconnaître l'autonomie professionnelle des enseignantes et enseignants dans le choix des outils et modalités d'évaluation et d'enseignement.
- Mettre en place de meilleures conditions d'attraction, d'insertion et d'exercice de la profession enseignante, ce qui contribuerait à la valoriser.
- Réduire la précarité d'emploi du personnel enseignant à tous les secteurs d'enseignement (jeunes, adultes et formation professionnelle).

Conseil Fédéral de la FSE

les 10, 11 et 12 décembre 2008
à l'Hôtel Loews Le Concorde
1225 cours du Général-De-Montcalm
Québec

En manchette

Un Papillon d'or pour les enseignantes et enseignants du Lanaudière

La Fédération des syndicats de l'enseignement souligne avec fierté le Papillon d'or décerné au Syndicat de l'enseignement du Lanaudière (SEL-CSQ) par le mouvement des Établissements verts Brundtland de la CSQ pour leur engagement significatif en faveur de la construction d'un monde écologique, pacifique, solidaire et démocratique. Félicitations à toute l'équipe !
Pour plus d'information sur le mouvement des Établissements verts Brundtland, cliquez sur l'image.

La FSE en images