The Education Data Issues Model: Using a knowledge mobilization framework to examine teachers‟ engagement with large scale assessment data as a means to enhance student learning.

by

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ABSTRACT

The purpose of this research was to examine the Education Data Issues Model (EDIM), as a useful conceptual framework through which to study teachers‟ engagement with large scale assessment data as a means to enhance student learning. The EDIM framework was developed by myself and was based on knowledge mobilization theory, together with educational literature on data use, it was applied to the study and was revised based on the results. Eight Grade 3 and seven Grade 6 teachers volunteered to participate in semi-structured interviews regarding their perceptions and experiences using data from large scale assessment to inform teaching practice and student learning. ATLAS.ti software was used to code and analyze the transcribed audio-recorded interviews. Analysis entailed the identification of themes and patterns across the data. The results supported the EDIM as a useful conceptual framework through which to explore teachers‟ engagement with data as a means of enhancing student learning. Modifications were made to the EDIM which represented the data from the interviews with teachers. Two main themes became apparent in the data: the importance of time and timing as it relates to a large-scale assessment (LSA) program and the importance of the social context in which teachers used LSA data. Implications of the findings for teachers, students and testing agencies are discussed.

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CHAPTER ONE: INTRODUCTION

Knowledge is defined in the Oxford Dictionary as: 1) information and skills acquired through experience or education. 2) the sum of what is known. 3) awareness or familiarity gained by experience of a fact or situation (http://www.askoxford.com/concise_oed/knowledge?view=uk). In the context of educational research, knowledge is typically thought of as being unique to the individual and "fluid", because knowledge evolves when new experiences are interpreted and amalgamated with other already existing schemata (Pajares, 1992). Some educational researchers define knowledge as data or information that is infused with meaning (Brown & Duguid, 1991). Other educational researchers divide knowledge into categories as it relates to professional practices. For example, work done by Nutley, Walter and Davies (2003), suggests that knowledge consists of: knowing about existing problems, knowing what strategies or interventions work, knowing how to put them into practice, knowing who to involve and knowing why action is required.

When applied to teachers, the term knowledge takes on more specific meanings. The meaning of knowledge as it relates to teaching is guided by a paper written by Shulman (1987), that has been cited over 950 times on knowledge, for teaching and foundations of the new instructional reform. He described seven categories of knowledge for teaching: content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational contexts, and knowledge of educational ends, purposes and values. Shulman‟s seven categories of knowledge for teaching have been used to guide research in teacher knowledge for over 20 years.

Teachers play a large part in knowledge mobilization, that is, using educational research to inform teaching practice (McMeniman, Cumming, Wilson, Stevenson, & Sim, 2000). The role of the teacher in knowledge mobilization is as an active mediator and transformer of knowledge

who creates new meanings and understandings to inform classroom practice. The evidence from professional development and learning highlights the importance of teachers‟ existing, structured and contextualised knowledge when informing teaching practice and student learning (Bell, Rundell & Evans, 2003; Bolam & Weindling, 2006; Cordingley, Bell, Thomason & Firth, 2005).

While much of the educational research literature on knowledge mobilization contains a description of the impact of educational research on teacher practice, there are other potential sources of knowledge that may impact teacher practice. One other source of knowledge for teachers is knowledge derived from interpretations of data from *large scale assessments*. There have been several studies on the process of making meaning from data that suggest teachers can use their knowledge generated from data for decision making purposes and improvements for teaching practices (e.g., Coburn, Toure & Yamashita, 2009; Heritage & Chen, 2005; Honig & Coburn, 2008; Lachat, 2001; Kerr, Marsh & Ikemoto, Darilek, Barney, 2006; Lachat & Smith, 2005; Mason, 2002, Wayman & Stringfield, 2006; Young, 2006). The impact of knowledge derived from interpretations of large-scale assessments on teachers and their teaching practices, is the focus of this research project.

Effective use of data from large-scale assessment to inform teacher knowledge and practice requires overcoming barriers. Typically, data analysis is not a domain for which teachers are trained (Printy, 2008). Educators, especially those at schools or school boards with limited resources, may not have access to experts in data analysis interpretation. Further, educational leaders vary in their comfort and confidence when analyzing results from large-scale assessments. Educators‟ capacity to use data to inform their decisions depends largely on their ability to understand the data, manage the data, ask good questions of the data, accurately analyze the data and apply the data results appropriately and ethically (Mason, 2002).

Work done by Mason (2002) suggests that there are six challenges for schools, which must be addressed initially and attended to continuously, as teachers build their capacity for using data for decision-making. These challenges can also be considered as factors that enable data use for decision making:

> 1) Cultivating the desire to transform data into knowledge; 2) Focusing on a process for planned data use; 3) Committing to the acquisition and creation of data; 4) Organizing data management; 5) Developing analytical capacity; and, 6) Strategically applying information and results (p.6).

Effective use of data depends on several enabling factors, including strong leadership, up-front planning for data collection and use, and strong human capacity for data-driven inquiry (Kerr, et al., 2006).

Knowledge of what to *do* to enhance teaching practice does not translate directly *into* practice, because applications are shaped by social, cultural and political considerations (Lavis et al., 2002; Lindblom, 1990). Practitioners may also be deeply enmeshed in practices and beliefs that are highly resistant to change (Levin, 2004). Finally, limited empirical evidence suggests that political (Levin, 2008) and organizational factors – culture, infrastructure, leadership and routines – have at least as powerful of an influence as individual volition and action (Syed-Ihksan & Rowland, 2004).

The purpose of this research is to study the Education Data Issues Model (EDIM), as a useful conceptual framework through which to examine teachers‟ engagement with large scale assessment data, as a means to enhance student learning. The purpose of the research is to obtain insights into teachers‟ perceptions about the use of data generated from the EQAO assessment program, in order to determine the extent to which teachers‟ knowledge based on data is mobilized, for improvements to their teaching practices. Numerous studies link data-driven

decision making to changes in school culture and teacher practice that other research has linked to improved student performance (Kerr et al., 2006). Common examples of changes in school culture and teacher practice as a result of data use, include: teacher reports of greater differentiation of instruction, greater collaboration among school faculties, as well as improved identification of students‟ learning needs (Chen et al., 2005; Copland, 2003; Feldman & Tung, 2001; Wayman, Midgley & Stringfield, 2005). Teachers‟ knowledge gained from their understanding and use of data from large scale assessment is a valuable contributor towards improvement of their instruction and teaching practices.

CHAPTER TWO: LITERATURE REVIEW

This chapter is divided into four sections. In section 1, entitled *Knowledge Mobilization* (KM), I present the rationale for adopting a definition of KM proposed by the Social Science and Humanities Research Council of Canada, and present the rationale for selecting Levin‟s (2004) Elements of Research Impact Model (ERIM) as the conceptual framework that will guide this research study. In section 2, entitled *Introduction to Data Use*, I draw links between literature on data use and KM and I argue that KM has the potential to structure and support our understanding of the ways (effective and ineffective) in which teachers make use of this information. In section 3, entitled *Building the EDIM Framework*, I synthesize Levin‟s ERIM (2004) with literature on data use and propose a modified conceptual framework that will be examined through this research study. In section 4, entitled *The Context of this Study*, I describe a brief history of the EQAO assessment program in Ontario and provide a description of the current large-scale assessments administered in Ontario by the Education Quality and Accountability Office.

Knowledge Mobilization

Definition of Knowledge Mobilization (KM)

There are several definitions of knowledge mobilization (KM). These definitions were selected because they are from sources in Ontario and therefore reflect the ideas of organizations in Ontario about knowledge mobilization, which may also contribute to the continuity of the study and may more closely approximate the ideas presented by the teachers. For example, one definition is provided by The Social Sciences and Humanities Research Council of Canada (SSHRC), who defined KM as “Moving knowledge into active service for the broadest possible common good. Knowledge mobilization involves working collaboratively to produce and share knowledge and making that knowledge accessible and useful to society” (Social Sciences and

Humanities Research Council of Canada, 2007). A second definition for KM is provided by The Ontario Neurotrauma Foundation, as "getting the right information to the right people in the right format at the right time, so as to influence decision-making" (Ontario Neurotrauma Foundation, 2008). A third definition for KM is provided by the website called "Research Impact: Turning Research into Action", sponsored by the University of Victoria and York University, in which knowledge mobilization is defined as "a suite of services that enhances the two-way connection between researchers and practitioners so that research and evidence can inform decisions about public policy and professional practice" (University of Victoria and York University, 2006). The definitions of KM in these examples highlight the range of perspectives from a delivery KM model to collaboration KM models.

The definition of KM provided by SSHRC is more applicable to this research study than the other definitions. SSHRC"s definition provides a holistic and complex theory of knowledge mobilization that is similar to the rationale used in the construction of Levin"s (2004) Elements of Research Impact Model, also similar to that used in the building of the (2010) Education Data Issues Model. First, the definition provided by SSHRC explicitly refers to KM as service, with the goal of mobilizing knowledge for the "broadest possible common good". In comparison, the definition provided by the „Research Impact" website refers to KM as a „suite of services", which implies mediating or brokering knowledge as a type of service. Second, the definition provided by SSHRC promotes the goal of KM as contributing to the improvement of the collective, towards learning and growth. The definition provided by the „Research Impact" website suggests KM is focused on decision making. Third, the definition provided by SSHRC refers to KM as encompassing collaborative work within both the production and dissemination stages, which addresses the collaborative and social aspects underlying successful KM. The other two

definitions do not highlight the social, collaborative aspects of KM. For these reasons, the definition provided by SSHRC will be used as a guide for this study.

Conceptual Frameworks

There are many conceptual frameworks that explain the components of KM (e.g., Lavis, 2006) although the terminology used in the frameworks vary. Many of the frameworks include a tripartite frame - a process, a product and a linkage between process and product. These conceptual frameworks contain varying degrees of complexity. Some of the models are linear, unidirectional, while others are circular or multi-directional. The conceptual frameworks contain varying levels of importance attributed to the different parties involved, such as researchers, practitioners and organizations. Many of the conceptual frameworks suggest priority of the work of researchers and of the production of research. Some of these conceptual frameworks address explicitly KM in education, and others contain general concepts that can potentially be applied to education.

Four conceptual models related to KM are described in the document entitled "The Impact of Educational Research" (DETYA, 2000). The conceptual models presented in the DETYA (2000) study are included in the literature review and are outlined as follows, because these models were developed based on combined findings from five separate studies, which make up the DETYA, providing a more thorough conception of KM for the present study. These four models describe the interactions and relationships between educational researchers, policy makers and practitioners in education. Although the names for these models use terminology that is different than knowledge mobilization, it is important to note that research and writing on knowledge utilization and knowledge transfer encompass a wide range of phenomena when referring to knowledge, as Love (1985) suggests:

> The diverse ways in which investigators have defined the process of transmitting information from the knowledge-generation setting to the utilization setting reflect the variety of approaches to educational change and policymaking (p.343)

The conceptual models of KM cited in the DETYA document are similar to the conceptual models of knowledge generation conceived by Landry, Amara & Lamari‟s (2001). The first model is a Traditional Knowledge Production model which refers to applied research traditionally undertaken in universities and agencies. Knowledge production in this model is intended for specialized audiences, frequently other researchers in the same field. Within this model, the impact of research on practice may be limited with relatively few people influenced by the research (Cohen, 1979) and there may be a potential gap of culture, interests and concerns between academic researchers and those of practitioners (Boggs, 1992; Wingens, 1993). Thhis model is an example of Landry et al., (2001) Science-Push model, which emphasizes research findings as the major determinant of the use of knowledge.

The second model is an Investigator-Applied Research model, in which the research undertaken has practical implications for practitioners. For example, there may be opportunity for practitioners to collaborate on the researchers‟ agenda. A variation of this model involves giving identified stakeholder(s) regular feedback on the progress of an investigation and its outcomes. Products from this model may include findings that have implications for policy development and subsequent systemic change. Typically, educational enquiry using this model is carried out by agencies that provide findings which relate to a defined area of educational policy making and action (DETYA, 2000). This model has been used by educational systems to develop large-scale educational reforms designed to change practice in schools. This model is an example of the Landry et al., (2001) Interaction model where there is more attention paid to the relationships between stakeholders.

The third model is an Investigator – User - Linkages model which embraces policy and program evaluation and associated studies designed to provide answers to specific issues and problems. Initiation of the study can come from the researcher and practitioner together, or by the practitioner. Either party can pose the problem, but after the problem is refined the researcher takes major responsibility for the investigation. Diffusion of the findings is done via reports and interactive techniques. Findings can be reported via academic channels; however, this is secondary to educators‟ reporting requirements. This model is another example of the Landry et al., (2001) Interaction model, similar to the Investigator-Applied Research model described above.

The fourth model is a User - Oriented Action Research model, where the research is typically undertaken in schools, sometimes involving partnerships between academic researchers and practitioners. The practitioners initiate the process in response to a local problem or issue. The key participants in the research are those directly affected or involved, such as practitioners and the process is collaborative. In most instances, action is an essential element. The model is based on the adequacy of local expertise to deal with local problems and to recognise the need for outside assistance when appropriate. This model is similar to the Landry et al., (2001) Demand-Pull model.

The four models of KM described above demonstrate the variety of potential conceptualizations of KM and the variation in linkages between stakeholders of KM. While these models each have value in specific applied settings, they do not include some other elements of KM that are relevant to this study, specifically, a focus on time and context. A conceptual framework that does include these elements was proposed by Levin (2004) and is called the Elements of Research Impact Model (ERIM). The ERIM is described in the next section.

Elements of Research Impact Model (Levin, 2004)

The Elements of Research Impact Model (ERIM) proposed by Levin (2004) is a conceptual model of KM that applies specifically to education. The ERIM is a multi-layered, multi-directional process for KM in education. The model includes a variety of key factors that are influential in the use of educational research for decision making, such as time, mediators, context of educational research production, social contexts in education, and the context of research use in education. Levin (2004) suggested that the key factors underlie most examples of research impact. See Figure 1 for Levin‟s conceptual model for KM in education.

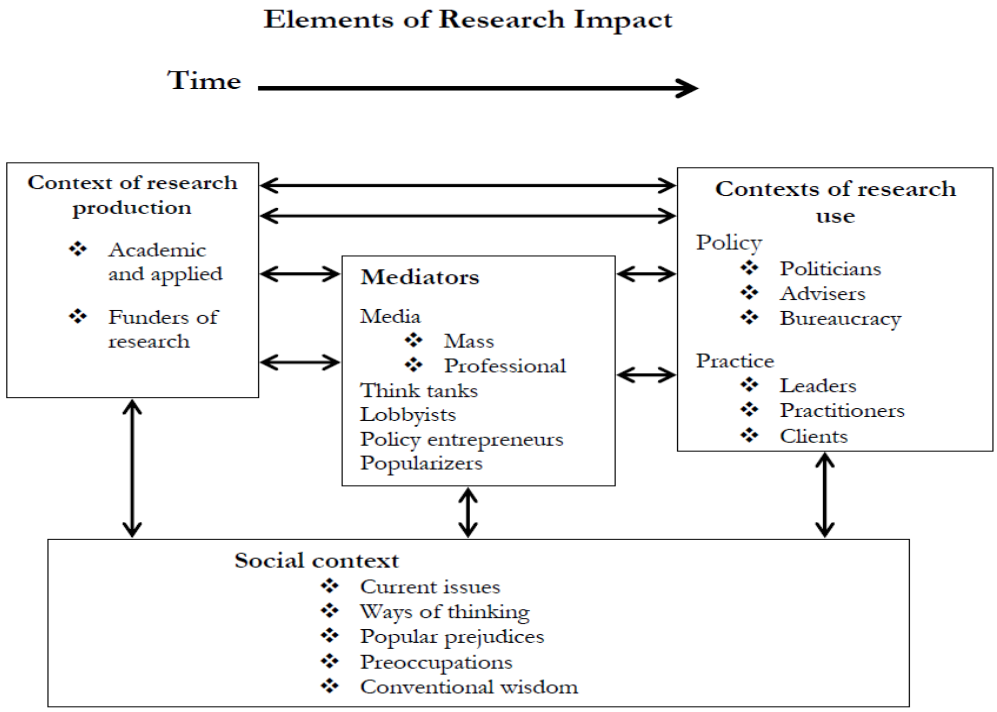

Figure 1: Levin‟s (2004) The Elements of Research Impact Model

Context of Research Production

In Levin‟s (2004) model the context of research production component includes what research gets done, who does it, how it is done, and how it is communicated. Research production

contexts tend to be academic or applied contexts with funders of research (such as the provincial government) supporting the production. Researchers have found three aspects of the context of research production necessary for an effective connection between research and practice/policy: planning for publication, networks, and researcher incentives (DETYA, 2000). Planning for publication within research production includes the development of targeted and imaginative mechanisms for publishing research findings to diverse audiences. For example, pilot testing publications or designing the dissemination of publications for specific practitioner/policy-maker markets according to current motivations within that specific context were effective. Networks involve the creation of focused and sustained relationships to facilitate the collaboration of researchers, policymakers and practitioners. These networks can work across educational organizations, disciplines and government agencies to enhance the impact of research on policy makers and practitioners (DETYA, 2002). Researcher incentives have been proposed to encourage researchers‟ continuous learning and development in their fields as well as their engagement with broader research communities. Researchers can also produce a range of publications and undertake steps to create two-way communication with the school sector. All of these elements require action to be taken on the part of the researcher and the decision maker and were found to optimize the impact of educational research.

Context of Research Use

Levin includes context of research use as the impact of educational research in schools that depends on educators‟ valuing research, their ability to apply it within their environment and to critique the research and its application within their context. Effective development of educators‟ use of research builds on what they know, can do, believe and care about already. Unless educators have the opportunity to make connections, new knowledge, ideas or skills may be forgotten, discounted or remodelled in to pre-existing practices and beliefs (Cordingley, 2008).

People in diverse contexts may vary in their conceptualizations of the use of research. Three categories for the use of research were suggested by Pelz (1978): instrumental use, conceptual use, and symbolic use. With *Instrumental Use* (Engineering Use) new knowledge derived from research is tied to direct action, for example, when research findings are used in decision making or problem solving. With *Conceptual Use* (Enlightenment Use) new knowledge derived from research leads to practitioners‟ increased conceptual understandings and long term changes. With *Symbolic Use* (Legitimative Use) however, the findings of an evaluation are undertaken for show without any intention of applying the findings (Owen & Rogers, 1999). These concepts illustrate the various ways practitioners use research and can help to clarify the processes inherent in its uptake and the generation of knowledge as a result.

Connections and Interactions (Social Context, Mediators and Time)

Levin (2004) includes the components of Social Context, Mediators, and Time recognizing that the impact of educational research on policy and practice is also mediated through broader social and political processes.

The social context in which educators work plays a vital role in their professional development and their use of educational research, which also directly impacts the mobilization of knowledge generated from using research as a result. According to Levin (2004) the impact of educational research and its use has been suggested to be impacted by a set of personal and organizational beliefs that can include: personal or organizational goals; the standards, policies and culture of the organization or occupation; the practical tasks that confront people every day; and personal predispositions and beliefs. The importance of the social context is also supported by research on school improvement (e.g., Fullan, 1992; Hopkins and Reynolds, 2001), on the practice of school reform as including the building of educators‟ capacity with particular attention being paid to the whole school context within which educators work. Personal contact and

interaction remains as one of the most powerful vehicles for moving research into practice (Levin, 2008). Earl and Timperley (2008), from their experience in professional development, describe the transformation of knowledge as a social process, as created through dialogue and conversation.

> Knowledge is created through dialogue or conversations that make predispositions, ideas, beliefs and feelings explicit and available. It is in these conversations that new ideas, tools and practices are created, and mutual knowledge is either substantially enriched or transformed during the process (p. 2).

According to Levin (2004) the contributions of third parties or mediators towards improving the connections between research and practice play a critical role in the spread and impact of research. Mediating work of various kinds is the decisive factor affecting knowledge take up and use. The DETYA (2000) study documents the importance of the roles played by third parties in disseminating and packaging knowledge as well as practitioners‟ working knowledge and local knowledge in mediating and adapting from other sources. Examples of third party mediators are: explicit knowledge mobilization agencies, lobby groups, the media, professional organizations, companies and individual entrepreneurs. At this time, the nature and roles of third party organization have not been much studied and are not well understood (Levin, 2008).

There is a great deal of research to support time as a key component of whether or not research will be used. Researchers have found that time is a crucial factor in contributing to the effective use of research or evidence in practice (Beyer & Trice, 1982; Hultman & Horberg, 1995; Lavis, 2006). Where research has impact, it occurs over extended periods of time (Weiss, 1979; Willinsky, 2003). In addition, the problem of "timing" is well-known, namely, that decision-making and practical actions do not lie in wait for research (Hultman & Horberg, 1995). Some researchers in education also posits that the timing of the availability of information is a

barrier to the effective us of the information (Popham, 1995; Stiggins, 1997; Supovitz & Klein, 2003; Wayman & Stringfield, 2006). Information must be available to practitioners in time for them to use it in order to deal with problems (Thomas & Tymon, 1982). Timeliness is a consideration within both fields of social sciences and education, as the phenomena under study may change faster than science can come to grips with it (Thomas & Tymon, 1982).

Introduction to Data Use

While KM is not typically used in reference to the uptake of assessment data to plan school improvement and enhance student learning, is it possible to use Levin"s (2004) ERIM to examine teachers" engagement with large scale assessment data and then adapt Levin"s ERIM in light of data use literature. In the following sections, I review literature on data use.

Data Use

Data use has been one topic of interest in education over the past fifteen years. Stakeholders continue to investigate whether this phenomenon leads to improvement in teaching and learning (Kerr et al., 2006). As educators gain experience with new ways of examining and using data, it is important to explore whether gains in educational productivity as a result of useful, actionable information flow that results from using data (Wayman & Stringfield, 2006).

Using data as a basis of teacher knowledge development is presently done for several purposes within the various levels of the educational system. Generally, data are used as part of the school improvement process towards task setting – such as annual and intermediate goals. Data can also be used as a means of informing school structure, policy, and resources. Schools have used data for decisions related to determining and refining topics for professional development (e.g., Mason, 2002; Supovitz and Klein, 2003). School personnel use data for instructional decisions such as identifying learning objectives, individualizing instruction, aligning instruction with standards, refining course offerings, identifying low-performing

students, and monitoring student progress (Kerr et al., 2006). Although many schools use data in this capacity, the impact may be limited unless teachers have the opportunity to work with and construct a real understanding of data.

Sense Making Theory Applied to Data Use

How do teachers make sense of data? The process of making meaning from data is complex and can be understood through sense-making theory. Sense-making theory is grounded in the study of systems engineering and human factors within the field of applied psychology. Sense making theory provides an account of how people come to understand and enact external cues - data in this case that are available to them in their environment. Sense-making theory suggests that the meaning of information cannot be given; rather individuals and groups must actively construct their own understandings and interpretations (Coburn, Toure & Yamashita, 2009). Individuals construct these new understandings by incorporating new information into their pre-existing cognitive frameworks, also called "working knowledge" (Kennedy, 1982; Porac, Thomas & Baden-Fuller, 1989; Vaughan, 1996; Weick, 1995). Therefore teachers in this instance, come to understand new information through the lens of their working knowledge, sometimes reconstructing it along the way (Coburn et al., 2009).

People with different beliefs interpret the same evidence in contrasting ways (Coburn, 2001). There are often multiple legitimate interpretations of the meaning and implications of a given piece of information (Johnson, 1997), which can sometimes lead to conflict and controversy. Furthermore, evidence does not always point directly to an appropriate solution. Rather, there is a space between a given finding and appropriate action, and interpretive processes and competing agendas sometimes play a large role in the process of moving information into knowledge and action (Coburn et al., 2009).

Sense-making theorists argue that interpretive processes are fundamentally social (Weick, 1988, 1993, 1995, 2005). Shared understandings become part of the working knowledge that can shape how individuals and groups interpret the meaning and implications of various forms of evidence (Coburn & Talbert, 2006; Kennedy, 1982; Spillane, 1998).

Shared understandings that guide interpretation emerge over time, as subgroups (like teachers) in organizations (such as schools) work together. The structure of an organization can also shape working knowledge and shared understandings, by influencing the patterns of social interactions through which they develop (Coburn & Talbert, 2006). Organization politics can also sometimes play a role as differences in interpretation become the basis of conflict, as individuals in different parts of the organization seek to promote an interpretation by employing their resources in support of their position (Weick, 1995).

Theorists believe that information becomes meaningful and prompts action when decision makers socially construct it – when they grapple with the meaning of the evidence and its implications for action (Honig & Coburn, 2008). In order for it to become effective, it must become infused and accepted into the school culture and organization (Mason, 2002). Researchers found it was effective when schools had learning communities where teachers could collectively share knowledge and solve specific problems of practice (Mitchell, 1999; Stein & Brown, 1997; Stein, Silver, & Smith, 1998; Supovitz, 2002). This was a major finding from the following two studies about the effective use of data (Mason, 2002; Kerr et al., 2006) which therefore warrant a closer look.

Educational Research Studies on Data Use: A Closer Look at Two Studies

The first study is a two-year study conducted by Mason (2002) which was designed to increase the capacity of six Milwaukee Public Schools‟ use of student, classroom and school data more effectively for decision-making. The overall goal of the study was to assess the efficacy of

using an electronic information system to support continuous school improvement and school reform.

Results suggested that, in order to be effective, data must become an active part of school planning and improvement processes and it must become infused and accepted into the school culture and organization. When the educators at the various schools were asked about their data needs, the group members consistently mentioned the need for developing a process and acquiring the skills that would better enable them to analyze and use data as a basis for decision-making. They needed to be able to work with the data. Mason also suggested that, as educators build their capacity for using data for decision-making, the following enabling factors must be addressed continuously: cultivating the desire to transform data into knowledge, focusing on a process for planned data use, committing to the acquisition and creation of data, organizing data management, developing analytical capacity, and strategically applying information and results.

The second study, research conducted by Kerr, Marsh, Ikemoto, Darilek & Barney (2006), examined the strategies employed by three urban school districts to promote data use for instructional improvement and their effect on administrator, principal, and teacher practice. The study used a comparative case study design and mixed methods to examine district efforts to promote instructional improvement. Purposeful sampling included three school districts which were located in different urban areas, all had a significant percentage of low-income and minority students. Results of this study suggested that the degree of staff buy-in, perceived usefulness, and use of data, were stronger in the two districts that invested more energy and resources in supporting schools‟ use of data. Two out of the three school districts created data-driven school cultures. Several factors were found to effect data use including accessibility and timeliness of data, perceptions of data validity, training, support for teachers with regard to data analysis and interpretation, and the alignment of data strategies with other instructional initiatives. In all three

school districts, timeliness of receiving data greatly influenced individual use. Individuals in all three districts commonly complained that data were not timely.

In Mason‟s (2002) study, human capacity (e.g., professional development and experiences with data management, analyses, interpretation and reporting) and the provision of supports enabled educators‟ use of data. Preparation played a role in terms of human capacity. In the school district where teachers reported that they were less prepared to use data, human capacity to use data suffered. Compounding the reported lack of human capacity were reports that principals were not as likely to help teachers with these tasks involving data and that professional development was less focused on data use. In contrast, the other two districts made investments in supporting educator‟s capacity with data analysis, and reported more frequent and extensive use of data. Individuals with strong data-analysis skills were assigned to „filter‟ data and make it more user-friendly, such as completing initial analysis and summarizing results in tables and graphs (a strategy found to be successful in other studies, such as Bernhardt, 2003; Choppin, 2002; Herman & Gribbons, 2001).

From these selected studies, a number of factors were identified that prevent successful data use while other factors were identified as facilitators for successful data use. Can these barriers and facilitators of the effective use of data be encompassed within a conceptual framework based on the ERIM, for the study of teachers‟ data use?

Building the EDIM Framework

In this section, I describe how I developed the Education Data Issues Model (EDIM). The EDIM framework was based on Levin‟s (2004) ERIM-based template and was transformed according to educational literature on data use, and the findings from this study. The major elements underlying the Education Data Issues Model (EDIM) are similar to Levin‟s ERIM (2004), however modifications were made that suit the context of data use in education.

The ERIM framework was chosen as a basis for the construction of the Education Data Issues Model (EDIM), because the ERIM framework was built by Levin to describe how educational research is implemented over time, describing the production and use of this research and how mediators and social context interact to affect the impact of research. This was a suitable base framework for the construction of the EDIM, because the EDIM is a specific instance of knowledge mobilization that is based on teachers‟ perceptions of knowledge gained from large scale assessment data and how that knowledge informs their teaching practice. According to educational literature on data use, the following factors have been suggested as enabling the use of data by educators: cultivating the desire to transform data into knowledge, human capacity, developing analytical capacity, leadership, up-front planning, organizing data management and strategically applying knowledge gained from data. These factors are described below and are included in the new conceptual framework, together with stakeholder groups and other prevailing issues.

Cultivating the desire to transform data into knowledge

The educators in Mason‟s (2002) Study of Electronic Information Systems in Schools‟ were eager to learn how to use data more effectively to improve school performance, increase student achievement, and demonstrate accountability; however, it should be noted that not all educators have this internal desire to transform data into knowledge. Many educators within the school community needed to develop an understanding about how data can and will be used, instilling a sense of trust and building the belief that data can positively contribute to improving teaching and learning and that this effort requires leadership, time, and patience.

Cultivating the desire to transform data into knowledge can be incorporated into two components within the revised framework: the context of data use and the social context (see Figure 2). The context of data use, which includes environmental and political conditions, may

have a positive or negative impact on educators‟ effectiveness to transform data into knowledge, depending on the availability of support, a culture of trust and relevant policies. Social context is relevant for cultivating the desire to transform data into knowledge such that role modelling or mentorship may be used to assist less experienced teachers on the use of data (Mason, 2002).

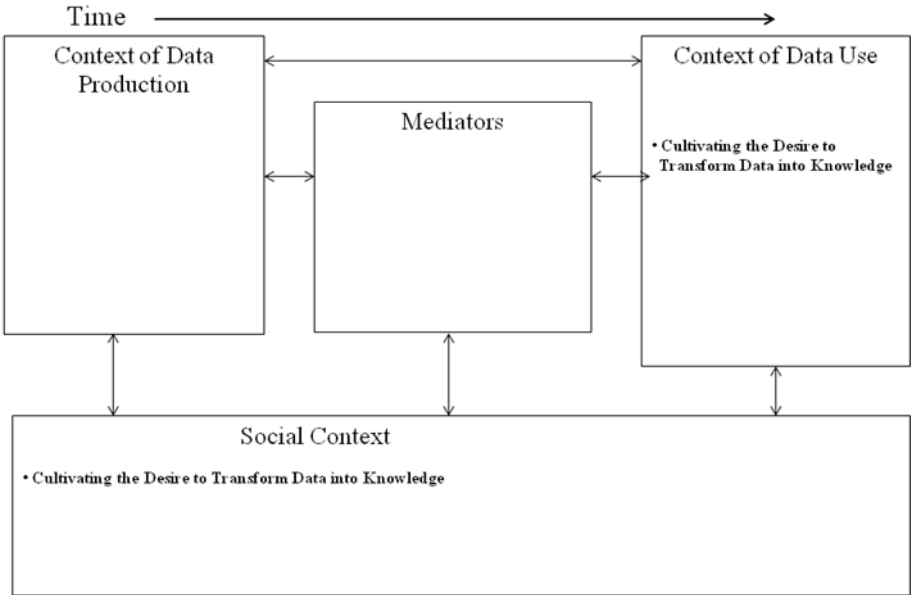

Figure 2: Cultivating the desire to transform data into knowledge

Schools have also used data for decisions related to personnel, such as evaluating team performance and determining and refining topics for professional development (see, e.g., Bernhardt, 2003).

Human Capacity

Teachers‟ lack of support (or capacity) for data-driven inquiry was found to be a barrier to effective data use in schools (Kerr et al., 2006). Researchers identified barriers to teachers‟ data use such as: technical difficulties with management information systems (Watson, 2002), teachers‟ lack of quantitative prowess (Choppin, 2002), philosophical commitments and political necessities that often prevailed over evidence (Corcoran, Fuhrman, & Belcher, 2001), data management policies and assessment practices that do not yield data useful to the targeted

practitioners (Choppin, 2002), dissensus around organizational goals (Herman & Gribbons, 2001), and school norms inconsistent with the intents of accountability policies. Educators sometimes have difficulty formulating questions and interpreting the results of large scale assessments (Herman & Gribbons, 2001; Mason 2002).

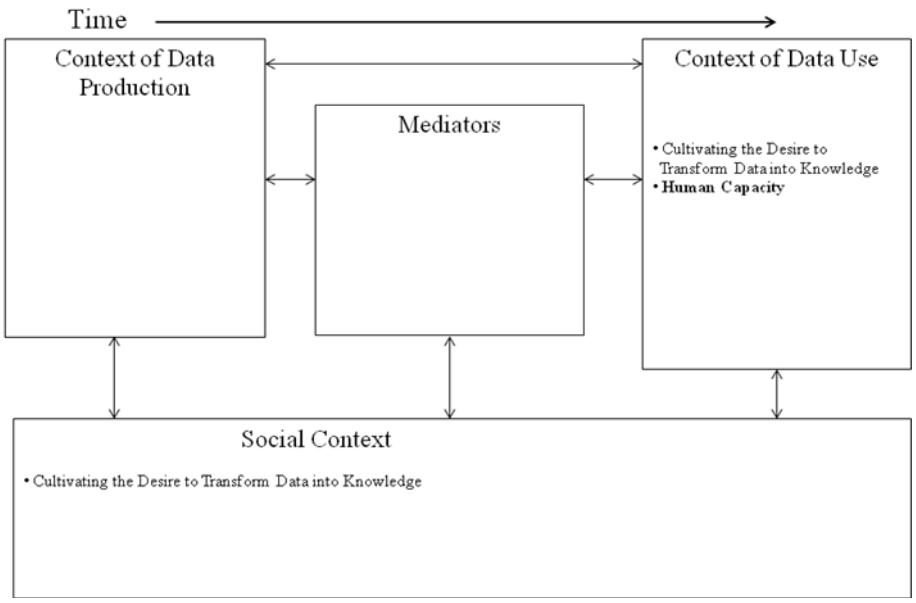

Figure 3: Human capacity

Human Capacity applies to the context of data use component of the conceptual framework (see Figure 3). Human capacity relates to the use of data for decision making as individuals vary in their professional development and experiences with data management, analyses, interpretation and reporting. Several professional development models have been proposed to help educators‟ talk about data using educators‟ own real-life data issues and school challenges (Chen et al., 2005; Copland, 2003; Love, 2004).

Developing Analytical Capacity

It is important that educators develop the analytical capacity to understand and apply data strategically (Mason, 2002). In response to educators‟ voiced concern for the need to develop analytical capacity in Mason‟s study, a short-course in research and analysis skills was provided.

In groups, educators learned how to frame questions, select appropriate data, and create focused inquiries. A steep learning curve in the development of one‟s analytical capacity was noted by a few educators in Mason‟s study as a barrier that prevented the development of several educators‟ analytical abilities.

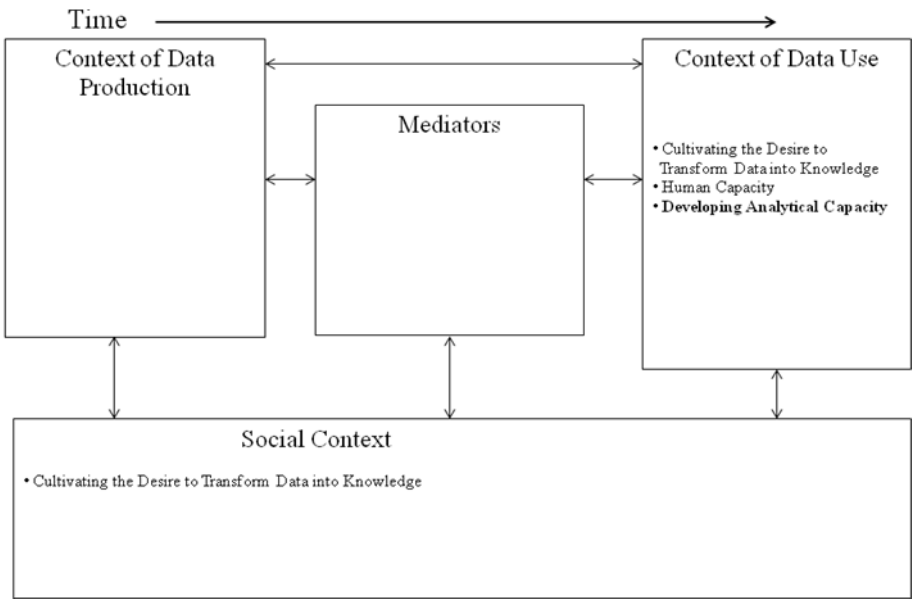

Figure 4: Developing analytical capacity

Developing analytical capacity applies to the context of data use within the conceptual framework (see Figure 4), it is an important component of understanding the strengths and limitations of using data to inform policy and improve practice. Analytic capacity can be developed in a social context when, for example, groups of educators form a professional learning community composed of individuals with diverse skills who learn with and from each other about how to derive knowledge from the data.

Leadership

School leadership is an important enabling factor for improving data use. Most assume that the role of leader is taken on only by those in an administration position such as principals;

however it also pertains to teachers as leaders. Leaders in schools that were able to effectively use data for inquiry and decision making were knowledgeable about and committed to data use and built a strong vision for data use in their schools (Choppin 2002; Feldman & Tung 2001). The benefits of developing a more distributed sense of leadership around data use among educators within the school have been effective (Copland, 2003; Wayman, Midgley & Stringfield, 2005).

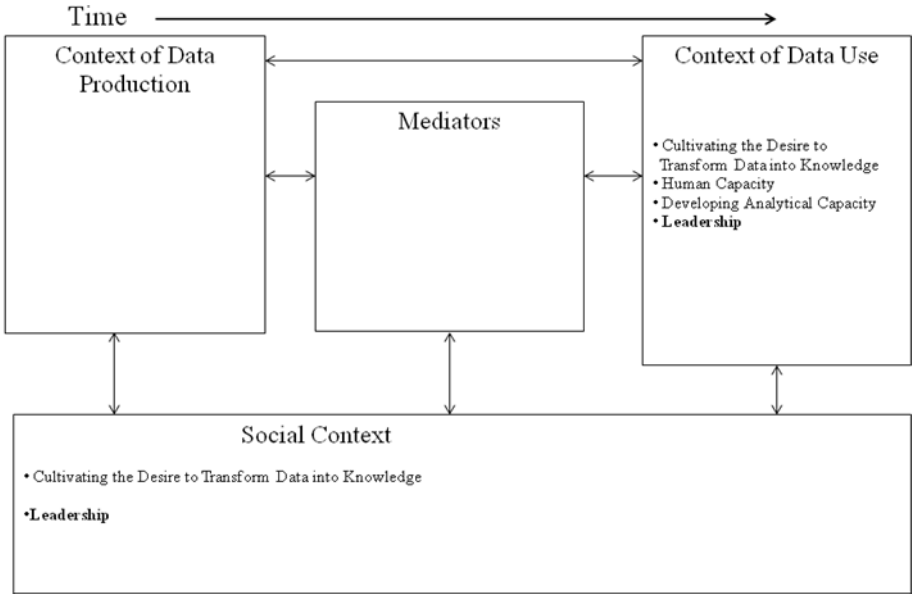

Figure 5: Leadership

Leadership appears foremost in the context of data use and the social context components of the conceptual framework (see Figure 5). Leadership is necessary for the appropriate interpretation of data and it can encourage new ways of thinking that manage prejudices and preoccupations which might be barriers to data use.

Up-front Planning

Data collection is positively influenced by up-front planning, such as the identification of which data are needed, the integration of multiple data sources and the maintenance of data collection processes (Keeney, 1998; Lachat, 2001). The allocation of needed resources and time is important to consider when planning for the incorporation of data into decision-making

practices. Planning should include a calibration process, where stakeholders develop consensus about shared standards, definitions, and goals through reciprocal inquiry-based discussion (Wayman et al., 2005). Using this planning process to involve a broad group of educators and to create clear expectations about the purpose of data use may help to improve teacher buy-in Choppin, 2002).

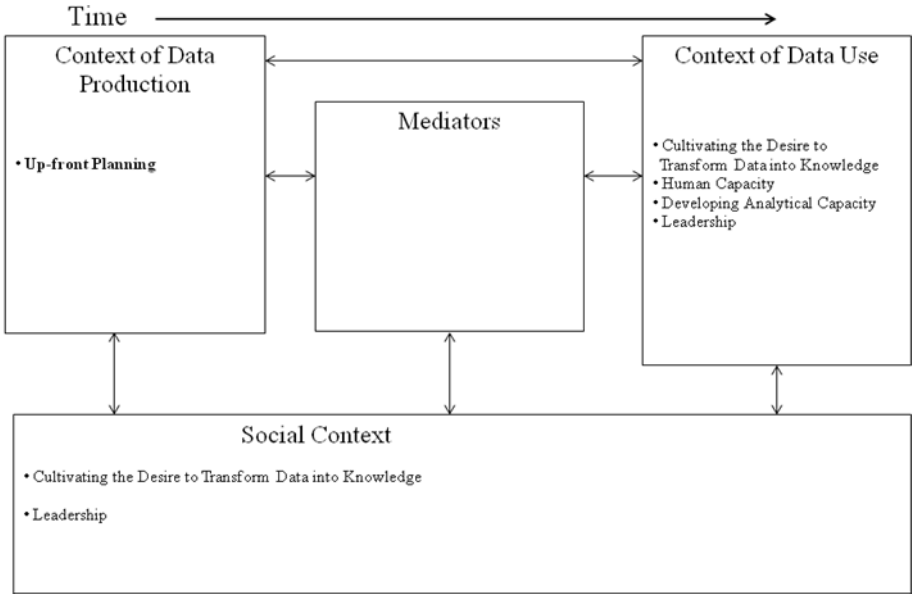

Figure 6: Up-front planning

Up-front planning applies to the context of data production within the conceptual framework (see Figure 6). Up-front planning also relates to time such that it should occur early in the process of data production and use, and requires that time be protected for the planning process and to obtain buy-in of educators.

Organizing Data Management

Ongoing effective data management is necessary for effective data use and it requires organization, resources and personnel. There is a gap between data collection and data application and, in between, data must be cleaned, secured, updated, imported into analytical software, analyzed, and formatted for reporting (Mason, 2002). The educators from the schools in

Mason‟s study found that acquiring the right data necessitated building new relationships with district personnel, becoming more involved in district technology and research planning, and becoming more familiar with their own school‟s information systems and databases. For most schools, obtaining clean and timely data that is in a useable format is sometimes difficult (Mason, 2002).

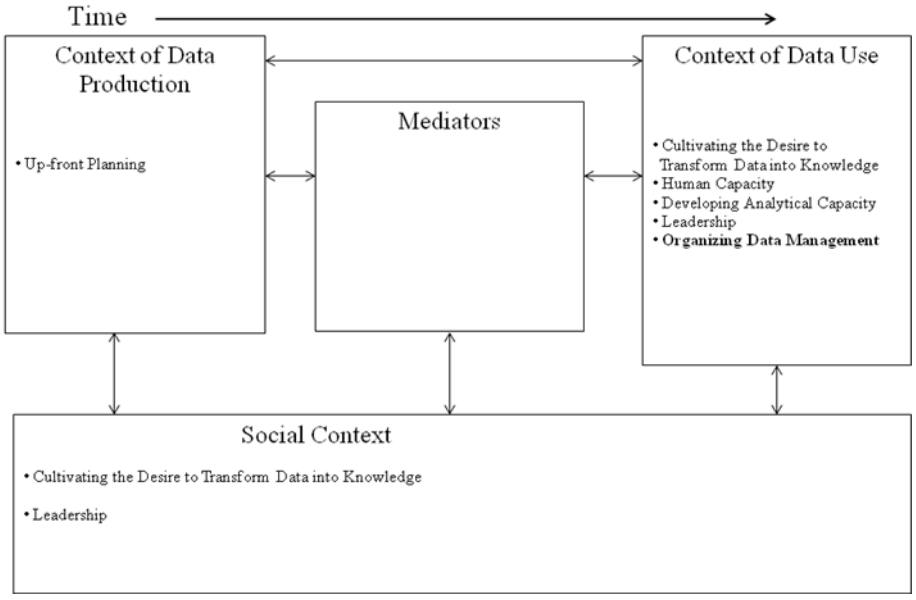

Figure 7: Organizing data management

Organizing data management applied to the context of data use within the conceptual framework (see Figure 7). In most instances organizing data management is the responsibility of bureaucrats and administrators; however, in the school setting teachers also take on the role of organizing student data.

Strategically Applying Knowledge Derived from Data

Educators need to learn how to apply knowledge derived from data and make purposeful and ethical use of information for improving teaching and learning. Schools must take the necessary steps to ensure that data are accurate, valid, and reliable and that the analytical process

is complete, equitable, and fair (Mason, 2002).

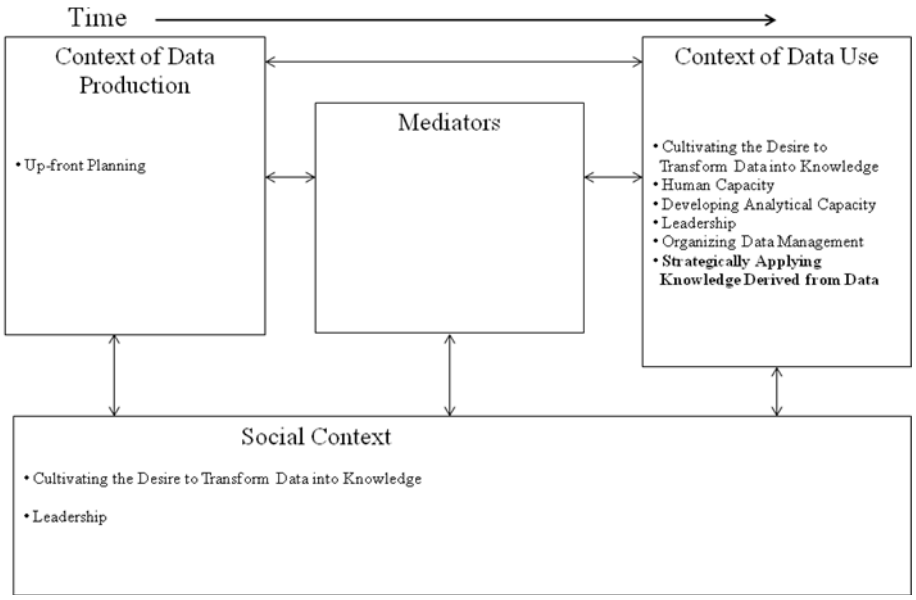

Figure 8: Strategically applying knowledge derived from data

Strategically applying knowledge derived from data applies to the context of data use in the conceptual framework (see Figure 8). The timing of the receipt of reports, the time for data management and for teachers or groups to draw knowledge from the data, and the time to chose and document appropriate improvement strategies all impact the strategic application of knowledge derived from data. The enabling factors are located in the new conceptual framework, within the contexts to which they most apply, however, there are other elements that should be included in each context such as, the stakeholder groups who work within each context, as well as other issues within the social context that can either inhibit or enable the use of data.

The additions of the stakeholders and other issues to the model are described and organized according to the construct in which they most belong and are described as follows.

Stakeholders within the Context of Data Production

Many individuals are involved with the production of data generated from large scale assessments. Those groups include: teachers who prepare students to implement the tests,

teachers who mark the tests, teachers who help to write test items, students who write the tests, governments who fund the tests as well as the personnel involved in test development and the compilation of reports. These individuals have been included in the context of data production (see Figure 9).

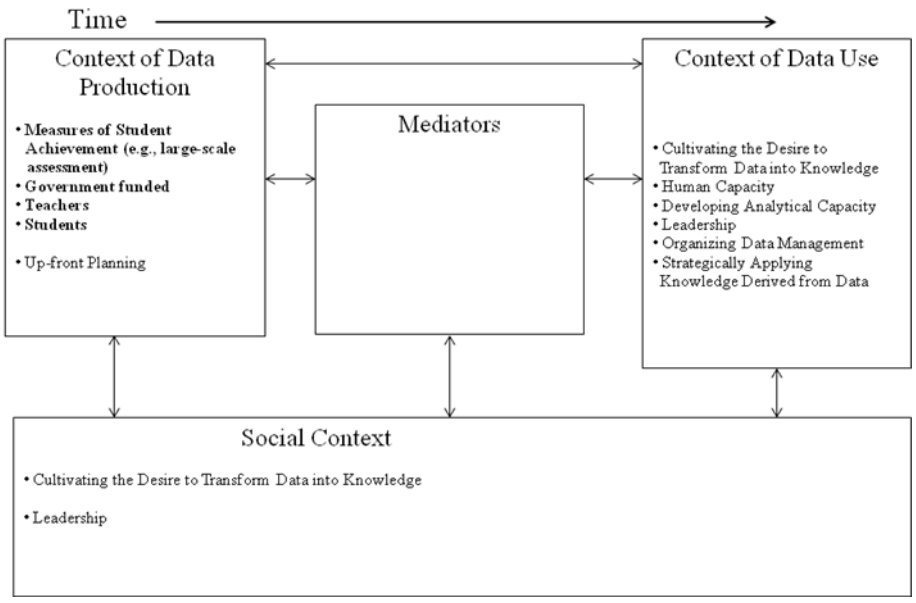

Figure 9: Stakeholders within the context of data production

Stakeholders within the Context of Data Use

The context of data use relates to both policy and practice. Within the field of educational policy, individuals such as politicians, advisers, and bureaucrats may use data to inform their decisions. Data may be considered along with other indicators, priorities and political agendas when establishing educational policy.

Within educational practice a variety of individuals use or are impacted by the use of data from large scale assessment. These individuals are educational leaders, principals, teachers, parents, and students. The ways that these individuals use and are impacted by data from large scale assessment varies.

These individuals have been added to the context of data use in the conceptual framework below (see Figure 10).

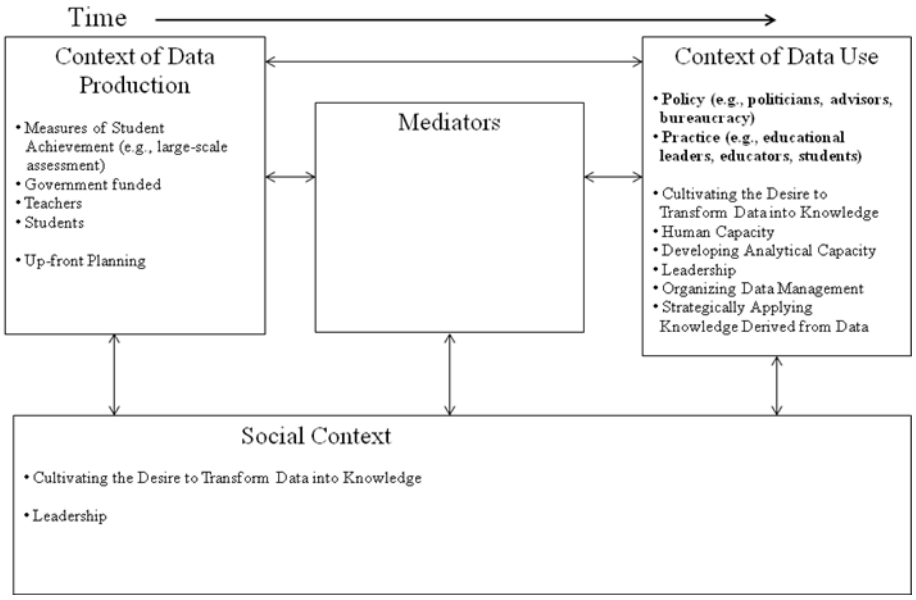

Figure 10: Stakeholders within the context of data use

Stakeholders as Mediators

Mediators serve to bridge the context of the production of data with the context of data use. Mediators include experts in data interpretation, experts in data management, educational leaders and other educators within the school, who act as a catalyst to mobilize knowledge related to data production and data use. The media may also be considered a mediator when, for example, newspapers report rankings of schools that are based solely on the results of large scale assessments. This is not considered effective mediation as these reports do not typically include contextual information or other measures of student achievement. This incomplete reporting may result in inaccurate interpretations of the data by the public. Principals, educational leaders and educators can also be considered effective mediators of data use within the school setting. Further research is required about the roles Principals have in mediating the use of data. These

individuals have been included in the conceptual model within the context of data production (see Figure 11).

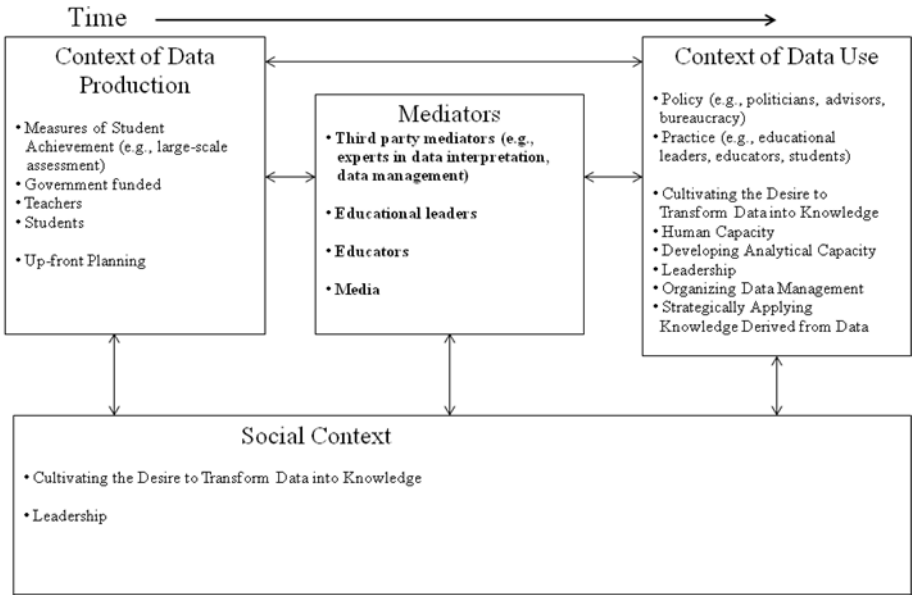

Figure 11: Stakeholders as Mediators

Issues within the Social Context

The underlying social context that affects the use of data derived from large scale assessment includes various plausible factors to consider, such as: current issues, ways of thinking, popular prejudices, preoccupations, conventional wisdoms, and school cultures. These issues were identified by Levin (2004) as involved in educators‟ use of research and may also apply to educators‟ use of data, such as large scale assessment.

Current issues are increasingly represented in the form of public discussion about student learning and the quality of the education system and are usually discussed within a social context. Educators are increasingly expected to compile student data throughout the year, and use it for assessment purposes. The efficient and effective use of student data, by educators, results in increased organization, documentation and, to some extent, accountability. The political context underlying data use can affect teachers‟ use of data as well, for example, Herman and Gribbons

(2001) found teachers in high-performing school found data use empowering, while those in low-performing schools felt devalued and disenfranchised by data use.

Educators‟ *ways of thinking* may affect the social context of data use within the school community and district. Educators who adhere to a way of thinking which does not support the use of data as a potential resource of knowledge used for decision-making will not buy-in to the processes or activities inherent in the production and use of data.

Popular prejudice can take the form of educators‟ preconceptions about the use of data for decision making. These prejudices may increase based on a lack of exposure or familiarity with the activities inherent in the production or use of data. Impartiality may also be exhibited among those who do not directly take part in the process of data production or use.

Educators may be *preoccupied* with using data as well as with their level of comfort and capability regarding the use of data for decision making, which acts as a barrier to the productive use of data. Since many educators have not been trained in data analyses, anxiety may be felt about potential errors in the interpretation of data. For example, educators in Mason‟s (2002) study felt that they lacked capacity for data use even after participating in training for a whole year.

School culture refers to the context where educators learn and work. Schools and districts sometimes vary in terms of different policies and mandates which affect the school culture. There are various pressures and supports available for educators within their schools and districts in terms of data use, which in turn, influences how educators perceive and use data. There is a need to examine how school cultures use data and the consequences associated with assessment (Linn, 1998). The motivations experienced by educators for the use of data may also depend on the educator‟s school culture. Two aspects of motivation that contribute to data-use have been highlighted by researchers: enthusiasm and commitment. Educators working within a school

culture where leaders are enthusiastic about how reports may enhance their understanding of children‟s learning are more likely to use data. As well, educators in a school culture that holds great value in and commitment to examining reports are more likely to collaboratively use the data to enhance their own teaching practice and student‟s learning (Deci & Ryan, 1987; Sutherland, 2004). These issues have been included in the conceptual model within the social context (see Figure 12).

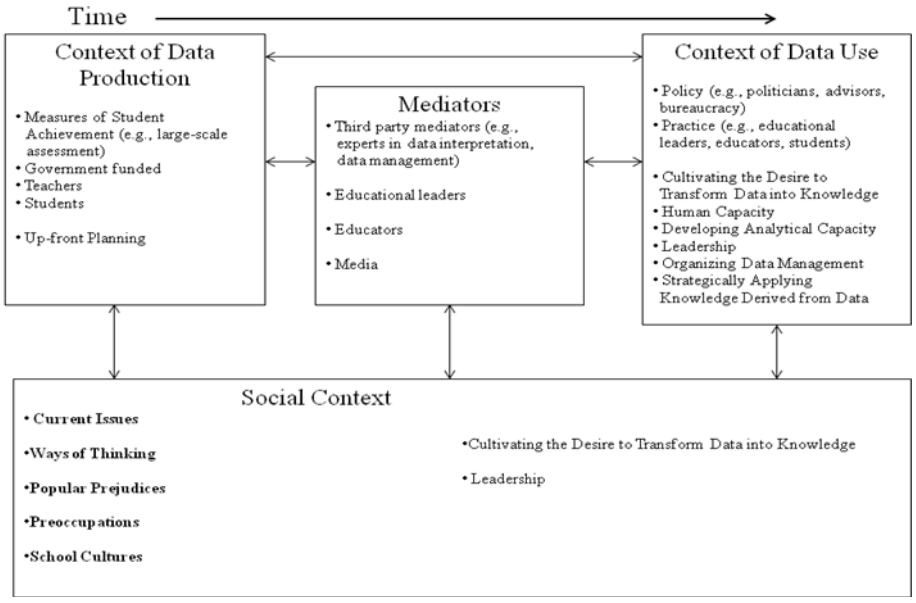

Figure 12: Issues within the social context

The Element of Time

Time is an important element related to the impact of data on educators and students. Time applies to all components of the EDIM framework. In the case of some large scale assessments, results are returned to the school months after the testing has occurred, usually in the next academic year (Mason, 2002). Mason (2002) acknowledges the large gap in time between data production and use. In some instances, if a large amount of time has passed between data production and data use, there may be issues with the applicability of data, the

compatibility of school software and the format of raw data (Mason, 2002). Time is highlighted and located at the top of the model, as it applies to all constructs (see Figure 13).

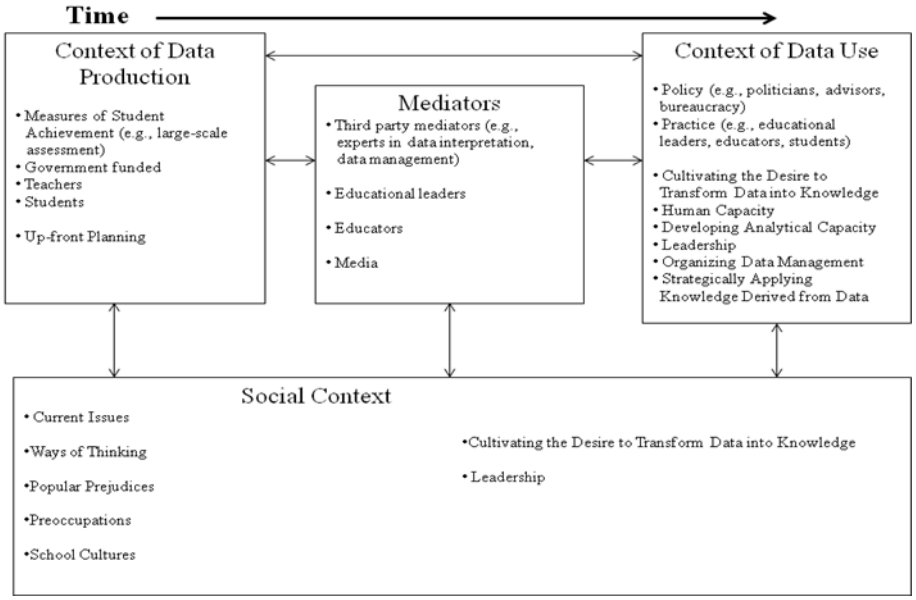

Figure 13: The element of time

The issue of test administration and the timing of administration within the school year that best supports the use of data generated have not been well documented in educational research to date. The intended uses of data generated from testing may be affected by the timing of the school year, as Ebel (1974) pointed out that tests given in the fall were usually intended "for guidance, for identification of individual problems and talents, or for placement and grouping", whereas those tests given in the spring were intended for "evaluation of educational programs or instruction".

Education Data Issues Model: Adaptation of Levin"s ERIM (2004)

The modified conceptual framework is titled Education Data Issues Model (EDIM). Note the substitute of the word *data* for the word *research* in Levin"s model. The preliminary model includes context of data production, context of data use, connections and interactions: social

context, mediators and time. Please see Figure 14 for a visual representation of the preliminary EDIM framework.

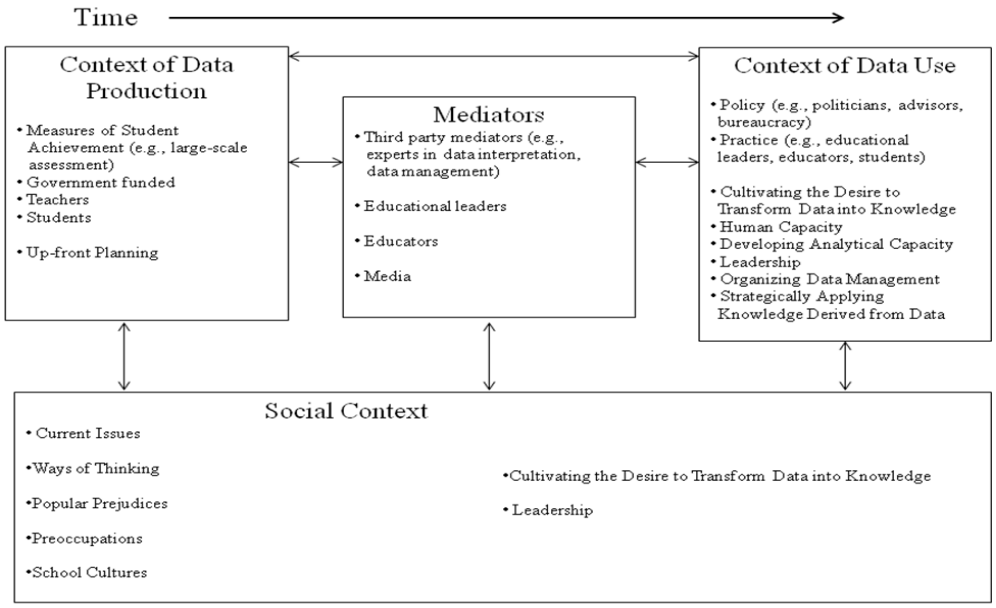

Figure 14: Hill's (2010) Education Data Issues Model

Is this conceptual framework sufficiently comprehensive and accurate to support a deeper understanding of teachers‟ use of data? This question will be addressed with the context of Ontario‟s provincial assessments in elementary classrooms.

Context of this Study

In Canada and internationally, there is a significant amount of educational data generated from large scale assessment, yet there is a need to study how to translate that data into knowledge and mobilize that knowledge in a way that teachers can use it and students can benefit from it. Given the emerging accountability frameworks and the call for data-based decision-making in education, there is a desire to use large-scale assessment data to provide information to guide instructional and policy decisions leading to system improvement and growth (Klinger, Rogers, Anderson, Poth & Calman, 2006).

The context of this study is large-scale assessment in Ontario. More specifically, the context of this study is on provincial large-scale assessments administered by Ontario‟s Education Quality and Accountability Office (EQAO). In the following section, I describe a brief overview of the history of large-scale assessment in Ontario and the current EQAO provincial assessments.

Ontario's Education Quality and Accountability Office

In 1996, EQAO was established by the Ontario government. EQAO‟s mission statement was to "assure greater accountability and contribute to the enhancement of the quality of education in Ontario". Part of the EQAO mandate was to administer large scale assessments of students in Ontario in selected grades on an annual basis.

Currently, the EQAO administers four large-scale provincial assessments: Grade 3 Assessment of Reading, Writing and Mathematics; Grade 6 Assessment of Reading, Writing and Mathematics; Grade 9 Assessment of Mathematics; and the Ontario Secondary School Literacy Test (OSSLT). EQAO‟s vision for province-wide assessments includes monitoring student achievement through the use of the same instrument to all Ontario students, implemented at a few critical transition points throughout students‟ learning. The EQAO tests include three types of items: multiple choice, short answer, and extended constructed response. In addition, some of the assessments have an investigations component in which students perform more complex tasks. The results of the assessments in Grades 3, 6 and 9 are judged on a 1 to 4 scale, with the score of 4 as the highest and the score of 3 reflecting the provincial standard, except for the OSSLT test, which is marked pass/fail. There are two grade 9 math tests, one for the applied program and one for the academic program. Successful completion of the OSSLT assessment is no longer a requirement for high school graduation on its own. Students can also obtain the credit through the completion of the Ontario Secondary School Literacy Course.

EQAO prints and distributes the tests to schools across the province. Once distributed among the select grades, tests are administered by teachers in their own classrooms. Typically, grades 3 and 6 students write the EQAO tests in half-day increments, over a week‟s time. Teachers are able to select the sequence of subjects (e.g., math or reading and writing) for test administration, which best suits them and their classes. The assessments are returned to EQAO for marking. After the marking is complete, EQAO creates reports for individual students, schools, school boards, and for the province as a whole. The reports are available to school administrators in the last week of August, and are provided to teachers in the first few weeks of September. The first report is an Individual Student Report, which indicates to parents and students how each individual student scored in relation to the provincial standards. Second, school and school board reports contain summaries of how individual schools and school boards perform in relation to other schools and school boards in the province. Third, a provincial report is produced which brings together results from across the province, and makes recommendations for improvements.

EQAO requires that educators make use of the student data in EQAO achievement reports. Schools are expected to formulate a school improvement plan based on the data in the school report as a means to increase student achievement for the following school years. EQAO promotes the creation of school improvement plans (prepared by the Education Improvement Commission) as a means to document the changes the schools and boards will make to improve student achievement.

Current Study

Provincial testing in Ontario provides an ideal context in which to study the Education Data Issues Model (EDIM), as the model can be built and aligned with examples of data use in

education in Ontario. The information provided by teachers‟ about the EQAO assessment program provides evidence that can be considered in relation to the EDIM.

The purpose of the EQAO test is to provide "an independent gauge of how well students are meeting the reading, writing and mathematics expectations defined in The Ontario Curriculum at key stages in their education…These assessments provide detailed information that schools and boards are using for local reflection and focused intervention" (p.4). While the purpose of the test in this quote may be interpreted in several different ways, the focus for this thesis is on the use of data by teachers for local reflection and focused intervention.

CHAPTER THREE: METHOD

Research Questions

The primary research question is:

1. Is the EDIM a useful conceptual framework through which to examine teachers‟ engagement with large scale assessment data?

The secondary research questions are:

2. What are the beliefs and assumptions of elementary teachers about the data generated from provincial testing programs?
3. What do teachers report as their perceived impacts (positive and negative), on students and teachers, of data generated from the provincial tests?
4. What do teachers report about the timing and method of knowledge mobilization of provincial tests and its impact on their pedagogical knowledge and teaching practice?
5. How can knowledge mobilization about provincial testing be improved to better suit the needs of elementary teachers?

Design

The design of the study is a basic qualitative research study (Merriam, 1998), where the motive is to assess the usefulness of the EDIM to examine the perspectives of elementary teachers on the topic of the provincial assessment program. The intention is, as Merriam (1998) summarizes, is to: "simply seek to discover and understand a phenomenon, a process, or the perspectives and worldviews of the people involved" (p.11). The basic qualitative study in education draws from concepts, models and theories in educational psychology, developmental psychology and sociology. The design of the study involves collecting data through interviews (semi-structured). The interviews were semi-structured in that they were conducted with a fairly open framework: the questions were flexible, allowing for focused, conversational, two-way

communication. Similar to the flexibility in the semi-structured interviews used by social science researchers (Leinder & Leidner, 1993; Beadsworth & Keil, 1992), the interviewing involved a degree of structure yet also "allowed room to pursue topics of particular interest" (Leinder & Leidner, p.238). As the interview progressed, interviewees themselves raised additional or complimentary issues, which formed an integral part of the study"s findings (Beadsworth & Keil, 1992).

> rather, the open-ended, discursive nature of the interviews permitted an iterative process of refinement, whereby lines of thought identified by earlier interviewees could be taken up and presented to later interviewees (Beadsworth & Keil, p.261–2).

The findings are a mixture of description, interpretation and analysis, an analysis that uses concepts from the theoretical framework of the study, with the identification of recurring patterns (in the form of categories or themes) across the data.

Procedure

This qualitative research study included two phases. In phase 1, the interview protocol was developed and pilot tested with the elementary teachers. The results of the pilot were used to revise the interview protocol. During phase 2, a second round of interviews with elementary teachers was conducted using the revised interview questions in the final interview protocol. Each phase is described below.

Phase 1: Development of the semi-structured interview protocol

Following ethics approval (see Appendix H), a convenience sample of two Grade 3 teachers, two Grade 6 teachers, one Grade 5/6 teacher and one Grade 2/3 teacher from the school board in North-western Ontario, volunteered to participate in a pilot test of the draft interview protocol. Participants were informed about the study via cover letter and consented to participate by reading the letter and signing the consent form. Volunteers participated in a personal semi-

structured interview of about 30 minutes. Pseudonyms were used to preserve the confidentiality and anonymity of participants. There was no identifying information linked to the data that participants provided. There was no deception as part of the study.

The pilot interviews were audio recorded and the recordings were transcribed. The pilot questions were revised based on participants‟ *responses to* the questions and their *feedback about* the questions. A new question about mediators was added to the interview protocol. The other questions had minor edits. The final interview protocol is found in Appendix G. To see the links between the interview questions and the EDIM, please see Appendix A.

Phase 2: Data Collection

Following approval of an amendment to the original ethics application (see Appendix J), potential participants were recruited by invitation that was circulated via email to all Grade 3 and Grade 6 teachers, in Lakehead Public Elementary Schools. Also, personal contact was made to follow up on the invitations. The first ten teachers to volunteer participated in personal semi-structured interviews. Since most of the questions on the pilot interview protocol required only minor edits, the data from six teachers in the pilot was included in the full study. Due to technical difficulties, data from one interview was lost. Therefore the total sample size for the study was fifteen teachers (eight Grade 3 and seven Grade 6), with some missing data for the new question. Similar to phase 1, data from the semi-structured interviews were transcribed from audio recordings.

Data Analysis

The method of analysis chosen for this study was a hybrid approach of qualitative methods of thematic analysis that incorporated both the data-driven inductive approach of Boyatzis (1998) and the deductive a priori template of codes approach outlined by Crabtree and Miller (1999).

Deductive coding included the development of a preliminary code manual based upon the overarching constructs in the EDIM framework (outlined in Appendix B, see the codes that are not underlined). Many of the codes referred to issues pertaining to data use (both barriers and facilitators). For example, the code human capacity can refer to a barrier when teachers' professional development or experiences do not provide them with ability to interpret the data. On the other hand, human capacity can refer to a facilitator when teachers have professional development or experience to use data to inform their practice. The development of the code manual was important because it served as a data management tool for organizing segments of similar or related text to assist in interpretation (Crabtree & Miller, 1999). The use of a code manual (see Appendix B) provided a clear trail of evidence for the credibility of the study. Inductive methods were used to develop codes that applied to stakeholder groups and "other" aspects that became prevalent in the data. The "Other" codes evolved throughout the coding of the data.

Transcribed data were entered into ATLAS.ti, version 6.1 software. This software facilitated the development of themes and patterns within and amongst the cases. ATLAS.ti was used to organize the content of interviews, compare and contrast emerging themes and draw conclusions based on the themes in the data. Using the Query Tool, and the Co-occurrence Table Explorer, the contents of each code were analyzed and used to answer the research questions. The Query tool is a way to access quotations for each code, as well as a way to conduct a Boolean search between codes.

The Co-occurrence Explorer was used to explore any possible co-occurrences between codes. The Co-occurrence of codes is important because in some cases, the terms, stems, and concepts that co-occur more frequently tend to be related (Garcia, 2004), however, co-occurrence

or possible relationships between concepts or codes does not imply causation. In this study, co-occurrence is defined as the "Co-Occurrence Index" or C-index:

$$C - index = \frac{n_{12}}{(n_1 + n_2) - n_{12}} \quad (1)$$

Where:

n_{12}: is the co-occurrence frequency of two codes c_1 and c_2

n_1: is the occurrence frequency for one code, c_1

n_2: is the occurrence frequency for a second code, c_2

The inclusion of the co-occurring frequencies helped to distinguish the number of times that the teachers commented upon an issue, while the co-occurrence coefficient helped to demonstrate simultaneous instances of codes and issues. Both help to distinguish any dominant themes or relationships between codes and elements within the context of the EQAO assessment program, presented through teachers' comments. The co-occurrence frequency also supported the decisions regarding any revisions to the EDIM framework which allow it to more closely reflect the teachers' perceptions of the current EQAO assessment program.

In the absence of interpretive guidelines for the Co-occurrence Index, the criteria for judging important relationships between components (e.g., elements) was the step-down method based on the rationale applied to the decisions of how many components to retain in a factor analysis study, originally proposed by Cattell (1966a, 1966b) and reported in popular stats books (e.g., Stevens, 1996). The criteria used for retaining the most important elements in the EDIM figure was a C-Index greater than 0.05. The criteria for reporting the most important relationships among elements in the results and discussion section were a step-down of 0.1 where applicable

and 0.05 where a step-down of 0.1 was not applicable. Elements that fell below the step-down criteria were interpreted as being less significant.

Interpretive rigor (Aroni et al., 1999) was the aim of this analysis which required a demonstration of how interpretations of the data were achieved and illustration of the findings with quotations from, or access to, the raw data (Rice & Ezzy, 1999). The interviewee‟ reflections, conveyed in their own words, strengthen the face validity and credibility of the research (Patton, 2002). A clear trail of evidence, which is required for interpretive research, was provided throughout the research process to demonstrate credibility or trustworthiness (Koch, 1994).

CHAPTER FOUR: RESULTS AND ANALYSIS

The chapter is divided into four sections. The first section contains a description of the sample of teachers. The second section contains a description of the final code manual which was revised during coding and analysis. The third section contains the answers to the primary research questions. The revised EDIM is found at the end of this section. The fourth section contains answers to the secondary research questions.

Sample

The population from which the sample was drawn was Grades 3 and 6 public school teachers at one school board in North-western Ontario. There were 43 teachers with Grade 3 students currently teaching fulltime, including teachers who teach split grades with Grade 3 students. There were 40 teachers with Grade 6 students currently teaching full-time, including teachers who teach split grades with Grade 6 students.

Of the 83 eligible teachers, 15 volunteered to participate in the study for a response rate of 18 %. The inclusion of the response rate is of interest because it highlights the availability and interests of teachers to participate in the study. There were eight Grade 3 teachers, and seven Grade 6 teachers.

Grade 3 and 6 teachers were the focus of the study for three reasons. First they administer the EQAO test. Second, they are currently involved in the EQAO program. Third they participate in professional development geared specifically towards EQAO. The teachers who participated were not required to have an accurate knowledge base about the EQAO program, because the purpose of the study was not to evaluate the accuracy of teachers‟ perceptions, but rather to develop a model of data mobilization issues as perceived by the Elementary teachers.

Of the 25 Elementary Public Schools within the School Board, seven schools were represented by teachers in the study. Four of the schools were situated in an urban setting and

three were situated in a rural setting. Six of the schools offered the regular English program to students, while only one school included both French Immersion program and English program available for students.

Profile of Teachers

The profiles of the teachers are summarized in Table 2. The first column includes the teachers‟ pseudonym with the type of interview, for example whether it was conducted in person or over the telephone. The second column includes a description of the location of the school, as either urban or rural and the program descriptions, for example French Immersion or regular English program. The third column reflects the grade the teacher was working at the time of the interview. The fourth column indicates the number of years experience that each teacher has had with administering the EQAO assessment. The last column refers to the total number of years of teaching experience for each teacher. The number of years of experience that teachers have had with the EQAO assessment is important because there may be variety in teachers‟ comments illustrating their experiences with the EQAO assessment, that are associated with the number of years of experience. Since the EQAO Provincial Assessment was first administered in 1999, the maximum number of years of experience that teachers have with the assessment is nine years.

Table 1. Profile of Teachers

Interviewee Name & Gender / Type of Interview	Description of School and program	Current Grade Teaching	Years experience administering EQAO	Total Years Teaching (present year exempt)
Bounce (female) In-person	Urban School, French Immersion	Grade 3	9	10
Sassy (female) In-person	Urban School, Regular	Grade 6	7	8
Beany (female) In-person	Rural School, Regular	Grade 6	6	6
Donna (female) In-person	Rural School, Regular	Grade 5/6 Split	1	2
Caper (female) In-person	Rural School, Regular	Grade 3/4 Split	6	6
Winston (female) In-person	Rural School, Regular	Grade 2/3 Split	8	15
Apples (female) In-person	Urban School, Regular	Grade 3/4 Split	4	10
Teresa (female) In-person	Urban School, Regular	Grade 3/4 Split	0	4
Winny (Female) In-person	Urban School, Regular	Grade 5/6 Split	4	4
Piama (Female) In-person	Urban School, Regular	Grade 2/3 Split	5	18
Freda (Female) Telephone	Rural School, Regular	Grade 2/3 Split	9	25
Rachel (Female) Telephone	Urban School, Regular	Grade 3	8	25
Scott (Male) Telephone	Rural School, Regular	Grade 5/6	2	7
Cathy (Female) Telephone	Rural School, Regular	Grade 5/6	6	12
Maria (Female) Telephone	Rural School, Regular	Grade 6	8	10

Revised Code Manual

The list of revised codes is found in Appendix C, Table 8. The first column includes the code name, the second column includes the constructs in the EDIM that the code most relates to and the third column includes the description for each code. There were no examples provided for the following codes: up-front planning and organizing data management. Codes that were *not* on the original code manual but were added during the process of coding are underlined to identify them as emerging from the review of data. Codes such as *principals* and *the media* were added to the revised code list because teachers suggested they were important. For example, the media played a large and sometimes unproductive role in the mediation of EQAO results to the public and principals were perceived as having a positive effect on teachers‟ use of data.

Answers to Research Questions

Primary Research Question: Is the EDIM a useful conceptual framework through which to examine teachers" engagement with data as a means to enhance student learning?

The primary research question is answered through (a) the examination of teachers‟ comments and (b) the co-occurrence frequency and co-efficient.

There were changes to the EDIM framework as a result of data analysis. The constructs were re-arranged and some were enlarged, while others were removed or added. The teachers‟ comments are presented as follows, in order from most to least frequent. Teachers most frequently commented on the context of data production and the context of data use. Teachers‟ comments provided evidence that these two constructs overlap. Time was a third predominant issue based on teachers‟ feedback, as was the social context, while mediators played the smallest role within the EQAO assessment program.

Context of Data Production

The context of data production received the most comments (213 comments) from teachers, which suggests that the context of data production was one of the most important parts of the EQAO assessment program. Many of the teachers‟ comments depicted the prominent role of students within the context of data production in the EQAO assessment program. Teachers required much more time and did more work related to data production, than for the context of data use. Table 4 contains a description of how the context of data production relates to the other codes within the EDIM framework, as well as provides the frequency of co-occurrence.

Context of data production: students.

Teachers‟ comments on the production of data were related to comments regarding students (co-occurrence index of 0.32). This was expected since teachers are concerned for their students and students have a large role in the production of EQAO data.

Table 2

Co-occurrence and C-Index for the Context of Data Production

Construct	Codes within the EDIM	Frequency of Co-occurrence	C-Index
Context of Data Production (code frequency 213)	Students (code frequency 95)	74	*0.32
	Time (code frequency 93)	61	0.25
	Impact Teaching (code frequency 46)	35	0.16
	Barriers (code frequency 35)	30	0.14
	Teachers (code frequency 57)	31	0.13
	Context of Data Use (code frequency 177)	40	0.11
	Ways of Thinking (code frequency 64)	23	0.09
	Facilitators (code frequency 19)	18	0.08
	Social Context (code frequency 66)	19	0.07
	Government (code frequency 17)	12	0.06
	Human Capacity (code frequency 67)	14	0.05
	Mediators (code frequency 41)	11	0.05

Note. Asterisks are attached to C-Index values falling above the step-down criteria of 0.05, since the retention criteria of a 0.1 step-down was not met in this instance, therefore the criteria of a 0.05 step-down was used.

Many teacher comments depicted how teachers perceived students as being negatively affected by large scale assessment. Bounce a Grade 3 French Immersion teacher, stated that her students sometimes struggled with the language used on the test:

> *For the French Immersion students in the math, some of the vocabulary that"s used, some of the terminology that"s used, they are not familiar with and it"s not even their first language, so that"s sometimes difficult.* (Bounce, Grade 3 Teacher)

Apples" comment was typical of teachers" perceptions of students experiencing test stress during test administration:

> *You try to keep them calm and not stress them, but it"s such a big event that some of them are really stressed as a result of having to write it, because you cannot help them and you tell them that ahead of time. During the test you can"t help them and they really don't understand until they are facing it "I'm sorry I can't explain it to you, I can't give you any help", I think the students really find it stressful, and I think it has a negative impact on their learning. There"s such a stress placed on the test, and it becomes the focus, and I think it"s a negative thing.* (Apples, a Grade 3/4 Teacher)

Rachel commented upon the struggles of her lower level students when asked about the impact of test preparation and administration of the EQAO test:

> *Well some kids don't really care, you mean, is that what you mean, like how do they react to it? Well, I guess, some of them - they ,get it" and other kids don't get it, so when I'm teaching I always find that the brighter kids get it and the other kids, the lower kids don't get it, so when you have the grade three testing it's like "I don"t get it, I don"t get it"- even though you"ve covered it. Some of them won"t remember and even though I"ve covered it and like you know we"ve covered it - but we"ve went over compound words "why can"t you pick out the compound word?" and they"ll drawn a blank - but I've covered it. But the brighter students usually have better retention and they'll remember it and they"ll do better on the test…* (Rachel, Grade 3 Teacher)

These findings are consistent with educational research which suggests that testing has the potential to cause some students extreme anxiety (Green, Johnson, Kim & Pope, 2007) and that teachers differ in how they frame the problem of test stress (Childs, 2009).

Context of data production within the EDIM framework. The EDIM framework was revised to reflect the importance of the context of data production due to the comments received from teachers (see Figure 15). In the previous EDIM framework, the context of data production was represented by a rectangle to the left of the diagram and was the same size as the context of data use. The context of data production is now represented by the largest circle, positioned to the

left of the diagram, as it received the most comments from teachers which suggested its importance.

The EDIM conceptual framework was revised to include the elements which were most frequently referred to by teachers in their comments about the context of data production for the EQAO assessment program. The elements that were referred to the most by teachers, such as students, was bolded and positioned at the top of the context of data production circle. Other issues that pertained to the context of data production that were included in the EDIM framework in a descending order were: time, impacts upon teaching, barriers, teachers, the context of data use, ways of thinking, facilitators, the social context, Government, human capacity and mediators.

Context of Data Use

The topic of the context of data use was the second most frequently occurring theme (177 comments). Teachers‟ comments suggested that they perceived a variety of barriers to using the data to enhance student learning. Teachers‟ comments suggested that they did not make use of data in the results reports independently, but rather engaged with and used the data within a social context, usually for goal setting (e.g., smart goals) for the school. Table 5 contains a description of how the context of data use relates to codes within the EDIM framework, as well as provides the frequency of co-occurrence between these codes and their C-Index.

Context of data use: human capacity.

Teachers‟ comments on data use were related to their comments about human capacity (co-occurrence index of 0.33). Teachers‟ capacity to interpret and use the student data varied. Most teachers reported using data for smart goals and school planning initiatives, whereas only a few teachers reported using data for specific improvements to their classroom practices.

Table 3

Co-occurrence and C-Index for the Context of Data Use

Construct	Codes within the EDIM	Frequency of Co-occurrence	C-Index
Context of Data Use (code frequency 177)	Human Capacity (code frequency 67)	61	*0.33
	Time (code frequency 93)	51	0.23
	Social Context (code frequency 66)	46	0.23
	Ways of Thinking (code frequency 64)	38	0.19
	Mediators (code frequency 41)	33	0.18
	Context of Data Production (code frequency 213)	40	0.11
	Students (code frequency 95)	27	0.11
	Teachers (code frequency 57)	24	0.11
	Developing Analytical Capacity (code frequency 21)	19	0.11
	Impacts upon Teaching (code frequency 46)	20	0.10
	School Cultures (code frequency 27)	16	0.09
	Principals (code frequency 10)	12	0.07
	Strategically Applying Knowledge from Data (code frequency 14)	10	0.06
	Organizational Factors (code frequency 23)	10	0.05

Note. Asterisks are attached to C-Index values falling above the step-down criteria of 0.1 and are discussed.

Many teachers stated that they usually interpreted data in the school reports with other educators, usually in a group setting such as Professional Learning Communities (PLCs). By

participating in PLCs, teachers in the school gathered to determine where their students had scored poorly the previous year (e.g., writing and topic development) and discussed school based smart goals.

> *I wonder if this will tie into our Professional Learning Communities, our PLCs, as a staff, we take the results and we see where we didn"t do so well at in September and then that kind of guides us in our PLCs, so last year it was writing paragraphs and topic development is where our kids bombed, so this year we"redoing some topic development and continuing on with making connections so we have the reading and writing connection there, so as a whole entire staff we"redoing that. (Interruption - students came in and left)...I'll honestly tell you I don't look at the results unless where at a PLC, I don"t lookat them.* (Caper, Grade 3/4 Teacher)

The benefits of group discussions about data are supported by educational literature as helping build human capacity among educators. Strategies include structured approaches to dialogue about data that uses educators" own real-life data issues and school challenges (e.g., Chen et al., 2005; Copland, 2003; Love, 2004; Murnane et al., 2005).

Only a few teachers provided detailed examples of how they used their knowledge gained from data for improvements to their individual teaching practices. Bounce"s statement provided an example of how some teachers have changed their activities in the classroom as a result of the previous years" assessment results.

> *Well the results of the EQAO assessments, I find my students, they do best with the reading and the math, and they don't do as well in the writing. I'm trying to change up this year the kinds of activities that I do with them in writing to try and help that, but I noticed that I started even last year, we started working with eight questions and home-run answer questions, like answer a part of the question in your response, prove, explain and I"ve found that though we worked and worked on that all last year when it came time for the test - they answered "because blah, blah, blah" so even though you worked on it all year long, so I don't know, and I"mtrying again this year and we"ll seehow it goes... ...So, in the areas that the students aren't doing well in, I try to emphasize more the next year. So that"s what I'm trying, and am using that to help with my planning. But, whether or not it"s actually achieving anything at this point - I can"t tell.*(Bounce, Grade 3 Teacher)

The above quotes illustrate that teachers predominantly use school data from the results reports for school improvements, and that they prefer to discuss their interpretations within a group setting.

Some teachers" interpretations of data were affected by their uncertainty about how to understand and interpret data accurately and by their perceptions of different interpretations of data. They stated that they were unsure about how to accurately interpret the data in the results reports.

> *My skills are limited because I'm not a mathematician and statistically those graphs come out as bar graphs and all of that and I don't have enough time to view them and absorb how that should impact on my daily teaching, or long term, you know, a few months in advance, or next term - what to do.* (Piama, Grade 2/3 Teacher)
>
> *But they never explained anything, so again it"s hard to decipher some of the information they get…*
>
> (I)In the results reports?
>
> *Yes, so I don't know, I don"t know how to use it sometimes.* (Maria, Grade 5/6 Teacher)

Some teachers reported that they felt that teachers, schools and school boards interpreted data differently. Teacher"s comments also suggested that they viewed the interpretation of data as an independent and unique process.

> *Yep, absolutely, absolutely, because results can always be interpreted in different ways, so it"s actually kind of nice to see what those numbers mean to one person and what those numbers mean to another person, to compare the results and it does help.* (Freda, Grade 2/3 Teacher)
>
> *How to interpret the data? I think that would be, within each school board across the province and within each individual school will interpret the data differently and will have different focuses. I mean you have to give them time to gather the data and interpret it and I think that they get it relatively; I mean they"renot tardy at all.*
>
> (I)You just stated that they interpret the data, could you expand on that?

> *Well I mean, I think that, that means gathering data and interpreting data, if they're graphing it and displaying it, so anytime that you're displaying data then you're interpreting it.* (Scott, Grade 6 Teacher)

The above quotes suggest that teachers vary in their certainty about how to effectually interpret data in the result reports and that this can sometimes hinder their use of data. Teachers, however, recommended the inclusion of next steps in the results reports, which they thought would help teachers interpret and use the data in the school results reports.

> *Other than the next steps, I think that would be better, instead of just saying "this is how you did" so we're looking "did we go up? did we go down?"...It's left to us to analyse the data, and perhaps if they had a component in there that said "well, if your scores are low here, your next steps are", in our practice we do next steps, maybe they could give us some next steps and say "if your low in this section try this, if your low in that then try this", that would be helpful.* (Apples, Grade 3/4 Teacher)

> *Yes, if they were to summarize and say in plain English not with a lot of percentiles, umm, If they were to say "Your school needs to focus on comprehension and understanding" or "Your school should do more numeracy skills" or,"This is where you've fallen down" can they just say it in plain English so I don't have to decipher the statistical sum of it all.* (Piama, Grade 2/3 Teacher)

Context of data use within the EDIM framework. The EDIM conceptual framework was revised in light of the frequency of teachers' comments about the context of data use for the EQAO assessment program. In the previous EDIM framework, the context of data use was represented by a rectangle to the right of the diagram and was the same size as the context of data production. The context of data use is represented by the second largest circle to the right of diagram.

The EDIM conceptual framework was revised to include the elements which were most frequently referred to by teachers in their comments about the context of data use for the EQAO assessment program. The element that was referred to the most by teachers, such as human capacity, was bolded and positioned at the top of the context of data use circle. Other issues that pertained to the context of data use that were included in the EDIM framework in descending

order, were: Time, Social Context, Ways of Thinking, Mediators, Context of Data Production, Students, Teachers, Developing Analytical Capacity, Impacts upon Teaching, School Cultures, Principals, Strategically Applying Knowledge from Data and Organizational Factors.

The Element of Time

Time was the third most frequently occurring theme (93 comments) in the teacher comments. Time and timing was perceived as being an important factor affecting the success of the EQAO assessment program. Time was a barrier of the production of data and use of data. Table 6 contains a description of how time related to the other codes within the EDIM framework, as well as provides the frequency of co-occurrence between these codes.

Table 4

Co-occurrence and C-Index for the Element of Time

Construct	Codes within the EDIM	Frequency of Co-occurrence	C-Index
Element of Time (code frequency 93)	Context of Data Production (code frequency 213)	61	*0.24
	Context of Data Use (code frequency 177)	51	*0.23
	Students (code frequency 95)	20	0.12
	Ways of thinking (code frequency 64)	14	0.10
	Teachers (code frequency 57)	10	0.07
	Mediators (code frequency 41)	6	0.05
	Human Capacity (code frequency 67)	8	0.05
	Organizational Factors (code frequency 23)	6	0.05

Note. Asterisks are attached to C-Index values falling above the step-down criteria of 0.1 and are discussed.

The element of time: context of data use.

Teachers‟ comments on time/timing were related to their comments about the context of data use (co-occurrence index of 0.23). Many of the teachers‟ interpretations of student data in the school results reports included references to time. Most teachers made references to the time of the school year in when they usually discuss and interpret the data in the results reports. Teachers usually stated that they typically incorporate the data into their goal setting and planning at the beginning of the school year.

> *Our PLCs are really geared around EQAO especially at the beginning and our first part of the year we look at the results during our staff meetings, we do look at them during our PLCs, I'm on the school advisory council and the school improvement team and we look at the in those avenues, we talk about them as colleagues, informally, division meetings, everything - everything is geared around that especially at the beginning of the year. That"s howwe set our goals in our school, that"s how we set our goals in our Junior division, and just as a school the direction that we have taken over the last number of years has definitely been as a result of EQAO testing.* (Sassy, Grade 6 Teacher)

A few teachers stated that it sometimes helped them to understand the data when they compared students or groups of students‟ test scores throughout time.

> *Well actually when the results come back we look at the previous, I believe it"s fiveyears and so we can see the same students that were in grade three, how did they change up until grade six, so that"s onegood thing, but again, with the dynamics of a particular class, some kids may have left, some may have arrived, but I guess the average may still be there. I'm not sure, but I'm thinking we can look at that and say well why in grade three were they - were all the girls and boys equal in math, at eighty percent or whatever, but in grade six the boys are at ninety percent, three or higher, but the girls are at forty two percent, that"s a hugegap - I mean I don"t think I"ve ever seen a gap that wide, but just to tell you and then we look at that comparison to say what happened in those three years that has changed, how the girls or the boys responded to this, or as a group how did the group change and at our school we"reactually fortunate a lot of us have been there for so many years so we know who the kids were way back, and we can compare from the previous years, so we know amongst ourselves.* (Maria, Grade 5/6 Teacher)

Some experienced teachers mentioned how the data in the results reports has changed through time and that there is much more data for teachers to consider now than there was in previous years.

> *Actually this year in particular, I've found that it's a learning curve as well, when I think about the first time that I looked at the results, how well they did, at that first number and*

I think that the results have changed over the years, there's certainly more data there now." (Sassy, Grade 6 Teacher)

Other teachers made statements in regards to time that suggested that they perceived low test scores to be a result of lack of time for teaching certain subjects.

You have to have your whole curriculum taught before the test so that you are a month short to start with, things like math - it really impacts, children have to retain and recall what you taught them in September, so you have to review. So you have to teach it in a shorter time plus review it. It makes you do less arts, less science, social studies because you really have to focus on literacy and numeracy. (Apples, Grade ¾ Teacher)

I find that it's just very stressful trying to cover everything within the amount of time that we have, and there's a lot ofchallenging concepts in grade six math, and so it would be nice to have almost that extra month to have for them to cover that. So, I always feel like I never do it quite as much justice as I'd like, umm, that's something that I've been working on too. (Sassy, Grade 6 Teacher)

Teachers' capacity to interpret and apply the data in the results reports was also limited by their perceptions of the timing of the receipt of test results. Some teachers believed that the test results were no longer useful or applicable to their classes, as their classes no longer consisted of the unique individuals to whom the results belonged. Bounce's comment was typical:

I think that it's more useful yes to have the testing going on closer to the end of the school year, but the publication of it, yeah if it came a little bit earlier in the school year then it would have more of an impact and it would be more useful. (Bounce, Grade 3 Teacher)

These comments suggest that time and timing played a crucial role in teacher's accurate interpretations and effectual use of data in the school result reports.

The element of time within the EDIM framework. The EDIM conceptual framework was revised in light of the frequency of teachers' comments about the element of time (see Figure 15), which suggested it was an important element within the EQAO assessment program. In the previous EDIM framework, the element of time was represented by the word „time" at the top left of the diagram, with arrows pointing to the right. The position of the construct time was not

adjusted during revisions due to teachers‟ perceptions that the EQAO assessment program was greatly affected by time and timing. The element of time received the third most comments from teachers which suggested it impacted data production and use. The other elements that also pertained to time and timing within the EQAO program, such as: students, ways of thinking, teachers, mediators, human capacity and organizational factors, were not outlined in the framework because many of these elements also interacted with the predominant contexts of data production or data use, of which time is a part of and are cited within those constructs.

Social Context

The social context was the fourth most frequently occurring theme (66 comments). The social context was perceived as a very important factor affecting the success of the EQAO assessment program, in most cases the social context was a facilitator for the use of data. Table 7 demonstrates how the social context related to the other codes within the EDIM framework, as well as provides the frequency of co-occurrence between these codes and their C-Index.

Social Context: context of data use.

Teachers‟ comments on the social context were related to their comments about the context of data use (co-occurrence index of 0.23). Many comments from teachers suggested that the social context in which teachers gathered to discuss, interpret and analyse the data facilitated the use of data for goal setting and improvements. When asked whether the social context helped teachers to discuss and interpret the data in the results reports, Winny stated:

> *Yes it does, because in every school that I've been in, we take that data and we look to see what it is that the kids need help on, and so we will look and say "oh okay, well the kids all didn't do well on their open response questions, and that's something we can work on, so then we will take that information with us and use that to drive our instruction to help, so we discuss it, we figure out what it is and we come up with strategies and we use that in our PLC's and whatwe could be doing in our classrooms.* (Winny, Grade 6/7 Teacher)

Table 5

Co-occurrence and C-Index for the Social Context

Construct	Codes within the EDIM	Frequency of Co-occurrence	C-Index
Social Context (code frequency 66)	Context of Data Use (code frequency 177)	46	*0.23
	Human Capacity (code frequency 67)	25	*0.23
	Developing Analytical Capacity (code frequency 21)	13	0.18
	Mediators (code frequency 41)	15	0.16
	School Cultures (code frequency 27)	13	0.16
	Strategically Applying Knowledge from Data (code frequency 14)	6	0.08
	Context of Data Production (code frequency 213)	19	0.07
	Organizational Factors (code frequency 23)	6	0.07
	Ways of Thinking (code frequency 64)	7	0.06
	Impacts Teaching (code frequency 46)	6	0.06
	Principals (code frequency 10)	4	0.06
	Leadership (code frequency 10)	4	0.06
	Media (code frequency 12)	4	0.06

Note. Asterisks are attached to C-Index values falling above the step-down criteria of 0.05, since the retention criteria of a 0.1 step-down was not met in this instance, therefore the criteria of a 0.05 step-down was used for determining the most important elements to discuss.

Some teachers reported that they would not have worked to interpret and use the data within the EQAO assessment program, if these activities were not completed in a social setting.

> *I only look at the EQAO results because we have to as a school, and I would never normally go digging through to try and figure out where my students are weak that year, because I do diagnostics to figure that out in the beginning of the year. I just do it at the professional level, for the meetings that we have and we're told that we have to look at it and I"mglad that we do it then because I don"t have that time to do that, because I wouldn"t do it otherwise.* (Winston, Grade 2/3 Teacher)

> *Yes, it would be impossible for me to do it by myself. It"s absolutely essential that you talk over the data with somebody, some way. And yes, it is included at XXXX (school name) in our PLC"s.But there again, the drawback is if you are a part of a staff where you don't get along, being as professional as you wish, you know - there are classes down the hall, it has to do with proximity - if my door is close to the other door - great, but if the physical proximity of my classroom is not - then my connection with that other person is rare and my interpretation of the data from theirs is very different.* (Piama, Grade 2/3 Teacher)

The above quotes exemplify how teacher attitudes and beliefs can sometimes affect the use of data. These comments also suggest that unless educators have the opportunity to work together to make connections, new knowledge, ideas or skills may be forgotten, discounted or remodelled into pre-existing practices and beliefs (Cordingley, 2008).

Social context: human capacity.

Teachers" comments on the social context were also related to their comments about human capacity (co-occurrence index of 0.23). The social context facilitated teachers" capacity to understand, interpret and use student data for improvements. The comment from Apples, a Grade 3/4 teacher, depicts how the social context in which teachers discuss the data enables their understanding and application of the knowledge generated from data in the results reports, thus improving their human capacity:

> *So we do discuss it, we of course discuss the test because it"s justa very tricky test. So we talk socially about those kinds of things, and of course at the staff and division meetings and PLC"s because it"s our smart goal ,,what are they not doing well at?"And we do look at the results and say ,,well, they need to practice more multiple choice"and we found that from the last year. Or, they are not answering the question, they may be writing a wonderful answer, but it didn"t answer the questions, so we need to practice ,,how do you answer it?"So we do talk quite a bit in social meetings, informally and formally.* (Apples, Grade 3/4 Teacher)

Teachers‟ analytical capacity was developed within a social context when, for example, groups of teachers gathered (e.g., in their professional learning communities) to learn with and from each other about how to understand and derive knowledge from the data in the results reports. When asked about the social context in which test results are discussed, Caper, a Grade 3 teacher stated:

> *our PLC, as a staff, we take the results and we see where we didn"t do so well at, in September and then that kind of guides us in our PLC"s, so lastyear it was writing paragraphs and topic development, is where our kids bombed, so this year we"redoing some topic development and continuing on with making connections so we have the reading and writing connection there, so as a whole entire staff we"redoing that."*
> (Caper, Grade 3 Teacher)

Social Context within the EDIM framework. In the previous EDIM conceptual framework, the social context was located at the bottom of the model. Changes were made to the size and shape of the social context in the revised EDIM framework, which more accurately reflected the importance of the social context which underlies the EQAO assessment program, as perceived by teachers. The social context within the EQAO assessment program is represented by a large half-circle in the shape of a bird‟s nest, in which the context of data production, mediators and the context of data use are „nested‟. The nest or half circle represents how data production and use for the EQAO assessment program occur within an underlying social context.

The social context of the EQAO assessment program included various elements that were included in the EDIM framework. The elements that were referred to the most by teachers, such as the context of data use and human capacity, were bolded and positioned at the top of the social context half-circle. The other factors pertaining to the social context were: developing analytical capacity, mediators, school cultures, strategically applying knowledge from data, the context of data production, organizational factors, ways of thinking, impacts upon teaching, principals,

leadership and the media. These elements were positioned from left to right in the social context half-circle in descending order of frequency of occurrence.

Mediators

Mediators received the fifth most comments (41 comments) from teachers, which suggested mediators of the EQAO assessment program were not a predominant element for teachers. Table 8 demonstrates how mediators related to the other codes within the EDIM framework, as well as provides the frequency of co-occurrence between these codes and their C-Index.

Mediators: principals.

Teachers" comments on mediators were related to their comments about principals (co-occurrence index of 0.31). This suggests that principals were an important part of mediation within the EQAO assessment program. Principals acted as mediators during PLC"s and staff meetings as they explained and guided group discussions on the implications of student data for the school and practice. Caper, a Grade 3 teacher, stated the following which suggested principals play a vital role as mediators:

> *And every administrator is different, I mean, he looks at the results- we see where we need to improve, we use it as an improvement tool. And then we kind of all take it from there. We"ll I guess if you"re looking at it as a Principal"s standpoint, he has the results in September I believe, so he can kind of plan his new school year with the staff and where to take the school as far as a goal goes. That might be positive and then he sits down with each teacher who taught the grade three or the grade six and we go through them, and then we bring it to our very first staff meeting, we have a staff meeting once a month, on Wednesdays we would have a staff meeting, we would see the results, we don"t see individuals scores you can if you want to, but we only see school wide results, how we did compared to other schools in our system, and that"s how we look at them and as a staff we decide where we need to improve upon for the school year and where our focus needs to be.* (Caper, Grade 3 Teacher)

When asked whether any mediators influenced interpretation of the data in school results reports, Winny stated:

I don"t know, maybe our principals, like I said I really don"t care about what the data says, but umm, if we have to look at it - which our principals do - that"s theonly person I"m hearing it from - is from the principal.
(I)So the principal acts as a kind of mediator?
Yes. But they"rethe messengers form the board, so it"s coming from the superintendants, and then it"s coming from the Ministry. (Winny, Grade 6/7 Teacher)

Table 6

Co-occurrence and C-Index for Mediators

Construct	Codes within the EDIM	Frequency of Co-occurrence	C-Index
Mediators (code frequency 41)	Media (code frequency 12)	13	*0.33
	Principals (code frequency 10)	12	*0.31
	Context of Data Use (code frequency 177)	33	0.18
	Social Context (code frequency 66)	15	0.16
	Parents (code frequency 12)	7	0.15
	Human Capacity (code frequency 67)	12	0.13
	Barrier (code frequency 35)	6	0.09
	Developing Analytical Capacity (code frequency 21)	5	0.09
	Ways of Thinking (code frequency 64)	8	0.08
	School Cultures (code frequency 27)	5	0.08
	Students (code frequency 95)	6	0.05
	Time (code frequency 93)	6	0.05
	Teachers (code frequency 57)	5	0.05

Note. Asterisks are attached to C-Index values falling above the step-down criteria of 0.1 and are discussed.

Mediators: media.

Teachers‟ comments on mediators were related to their comments about the media (co-occurrence index of 0.33). Many of teachers‟ comments about the media were negative. Teachers‟ believed that the results were misrepresented to the public, whose opinions were impacted. One example provided by teachers about the media as mediators was that they publish the school results reports in the local newspaper and teachers stated that they often manipulated the data often exaggerating results or pinning schools and school board against one another. This was a negative instance of mediation within the EQAO assessment program and more than likely contributed to a misinformed public.

> *One of the barriers of the receipt of the results is the media, unfortunately, we find as a profession that it‟s not apositive experience, and for myself I‟ve always seen the big picture which is that big number that comes out „here‟s whatthis school did in writing, here‟s whatthey did in math‟and if you delve deeper into the results, you start to see the reasons why, and that would be a barrier now that I‟mthinking about it as well - we have special needs students in our school who don‟t write the test, however, they are a part of that score, so I feel that that is not a fair depiction of what our students can achieve here for instance, last year I think we achieved a sixty nine in reading, and our goal had been seventy, so I was very pleased with that because I think we started at fifty the year before, however, if you were to take out those students who were not receiving a score, I think it bumped us up to a seventy eight or something, so that‟s not something the media would see, they just concentrate on that one number, and I think it has an impact on teaching as a profession and certainly us as educator, we just sort of cringe.* (Sassy, Grade 6 Teacher)

> *Oh well you hear the rotten reports every year that come out in the newspapers, well locally it‟s the catholic board versus the public boards, every year right? The catholic board has this percentage of kids at grade level and you know and this and then they‟ll often report on a specific school. „This school had a huge jump and they bought all of these books last year and they implemented this program and that program‟and absolutely they‟reall over these numbers and EQAO was fairly adamant when they first came out that this was not what it‟s aboutit‟s not so that parents can go school shopping which is what they tend to do, maybe not in this areas so much as southern Ontario, it was not meant to rank one school against the other, it was not meant to judge how good a teacher was and all of that, it‟s justa load of BS and every year the media gets a hold of it - it doesn‟t help.* (Cathy, Grade 5/6 Teacher)

Mediators within the EDIM framework. In the previous EDIM conceptual framework, mediators were positioned within their own rectangle in the middle of the diagram between the context of data production and the context of data use. Changes were made to the size and shape of the mediators‟ rectangle in the revisions to the EDIM framework. The shape for mediators was re-sized and positioned between the circles for both contexts of data production and data use. Teachers provided the least amount of comments about mediators, which suggested that mediators did not play a very large role in linking the context of data production with the context of data use for the EQAO assessment program. For this reason, the construct of mediators was given the smallest amount of space within the figure.

The elements that were referred to the most by teachers as pertaining to mediators, such as the media and principals, were bolded and positioned at the top of the mediators. Other issues were added to the mediators construct, these were: context of data use, social context, parents, human capacity, barriers, developing analytical capacity, ways of thinking, school cultures, students, time and teachers.

In conclusion, the EDIM framework was a supportive resource during both the conceptualization and writing stages of research. The EDIM framework provided a way to organize the various elements within the EQAO assessment program. The important issues according to teachers within the EQAO assessment program were made clear, through the re-construction of the EDIM conceptual framework. The main components within the EQAO assessment program, being the context of data production, the context of data use, time, the social construct and mediators were re-configured in the EDIM framework in a way that represented their importance to teachers. The relationships between major constructs were also made clear through the visual representation provided in the EDIM framework. The sub-elements or factors that pertained to each construct were listed in each construct, as the elements with the strongest

relationship were bolded and positioned at the top of the construct and the other elements were listed in descending order of importance.

Revised Education Data Issues Model (EDIM)

The preliminary EDIM model was based on the main components of Levin‟s (2004) ERIM framework, with the elements reflecting research literature on data use and KM. The EDIM was revised according to a qualitative analysis of teachers‟ responses together with the co-occurrence index, which helped to identify which elements pertained to each construct.

The layout of the EDIM framework was re-shaped into one picture that reflects the context of the EQAO program with the same components involved from the preliminary model. The shapes representing the main components appear interconnected and conjoined because the components (e.g., data use, data production, time) and elements listed (e.g., human capacity) do not function in the EQAO program as independent entities, these constructs are interconnected and interdependent, which is why the EDIM model is best represented as one single unit. The circles representing data production and data use, together with the rectangle for mediators sit inside the half-circle of the social context, because these processes occur among individuals within a social context. It‟s important to note that the groupings of constructs do not only represent barriers to data production and use, but also highlight facilitators of data use. Time is also included in the model, as it is associated with each construct and element.

The following example may help the reader understand the decisions that were made when constructing the final EDIM framework. For example, teachers‟ feedback about the role of students in the EQAO assessment program and how students relate to the other elements and contexts is provided. Teachers mentioned students with regards to the context of data production, more so than the other elements, which is one reason why students were bolded and listed at the top of the context of data production circle. Students were supported by teachers‟ comments as

being a very important part of data production, as all teachers who were interviewed made comments about students‟ learning, as they prepared for and wrote the EQAO test. Students, however, are listed seventh in the context of data use space, as students did not co-occur as highly as the other elements with the context of data use, because teachers either did not mention students‟ involvement in using test data, or in the few cases where students were mentioned, it was with regards to their lack of involvement. Students were listed eleventh in relation to mediators, as teachers did not make many comments about students in a mediator role, or in relation to mediators. Students were not included in the social context space, as teachers did not make many comments about students‟ social involvement in the EQAO program and when they were mentioned it was with regards to the context of data production.

The EDIM conceptual framework is not free from bias or error. This conceptual framework is a representation of the information presented by the participants, which was qualitatively analysed and transformed into a visual model reflecting my understanding of the phenomenon. The revised conceptual framework is presented in Figure 15.

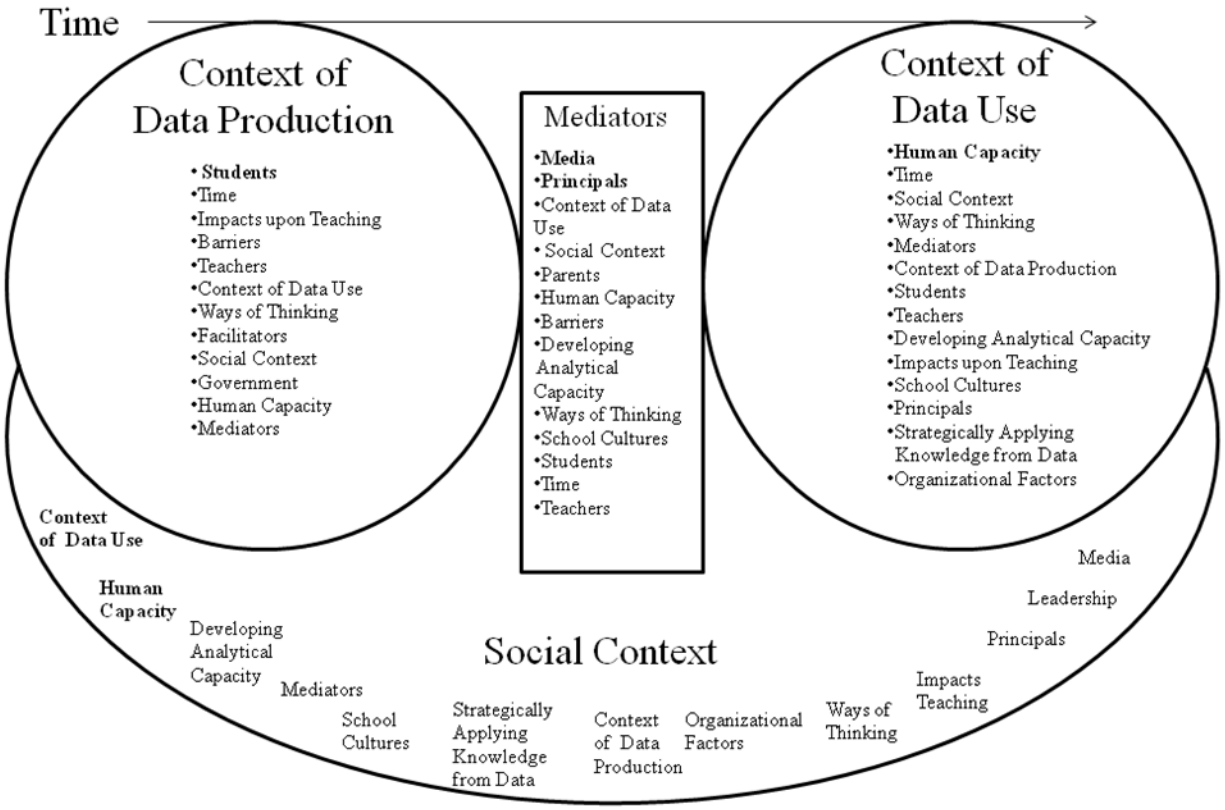

Figure 15: Hill's (2010) Education Data Issues Model for EQAO Provincial Assessment

Secondary Research Questions

Question 2: What are the beliefs and assumptions of elementary teachers about the data generated from provincial testing?

There were two main themes in teacher comments. The first theme was teachers‟ beliefs and assumptions about the validity[1] of the EQAO test. The second theme was teachers‟ beliefs and assumptions about the reliability[2] of the EQAO test. Teachers also mentioned impacts upon students and the stakes involved which related to assessment outcomes. These themes are important because teachers‟ perceptions about the value of the test acted as a barrier against their use of data in the results reports. Many of the teachers felt the test did not produce an accurate representation of student‟s abilities.

Teachers‟ beliefs and assumptions about the validity of the test were categorized into three groups: the item format on the test, content validity and the length of the test. An example of concerns regarding the content of the test was brought up by Scott, a Grade 5/6 teacher, who believed that data reflected a „snapshot‟ of his students‟ abilities and that the content of the EQAO does not include questions which reflect differentiated instruction methods that are used to teach students in the classroom:

> *Again, it‟s a snapshot ofthe student‟s year and I mean even myself as a classroom teacher, we usually strive for the most consistent assessment, in many differentiated instruction and assessment /evaluation, the EQAO does not allow for that.* (Scott, Grade 5/6 Teacher)

[1] Kane (2006) defined validity “as the extent to which the evidence supports or refutes the proposed interpretations and uses” (p.17), where the same test score “may have several legitimate interpretations and may be used to make different kinds of decisions” (p.29).

[2] Reliability is defined as "the degree to which test scores are free from errors of measurement.... Measurement errors reduce the reliability (and therefore the generalizability) of the score obtained for a person from a single measurement" (AERA et al., 1985, p. 19).

Another example is provided by Sassy a Grade 6 teacher, who stated that the vocabulary and situations presented on the test items were more familiar to students in southern Ontario, which might raise questions of fairness for students in other regions:

> *I've found that here in our region a lot of the language was based on prior knowledge that students maybe had down in southern Ontario, but not so much here, even names, the diversity of the names that they chose for the questions, was very difficult for my students to grasp, so they lost their focus just based on the names even that were used, so that was something that we had to bring up for the next year, and just you know, we call things camps up here but down in southern Ontario they call them cottages, so my students might not really think of it the right way if the word cottage is used, so those kinds of things that we've highlighted over the years.* (Sassy, Grade 6 Teacher)

Cathy a Grade 5/6 teacher suggested a degree of disjointedness between the format of the test and teachers' best practice in the classroom:

> *I feel that obviously I don't put a lot of validity in the test, so and we know, like even the wording of the questions can throw a kid and multiple choice, the way we teach now a day's like multiple choice is the worst way in the world to teach math, we never give our kids multiple choice questions when we really want to know what they know about math right? it's a communication mark, 'draw me a picture or explain to me your thinking' it's not like 'here take a guess, out of four things' the only time we teach them how to answer multiple choice tests is when we're trying to show them 'look this is the silliness you have to do on the grade six test' so we teach them how to answer multiple choice for the sake of the test, but, so when I look at data and see that a kid like bombed and got three out of ten on multiple choice, I don't believe that tells me what they know about math.* (Cathy, Grade 5/6 Teacher)

The length of the test was perceived by Apples a Grade 3/4 teacher, as being too long for her grade three students and was not a valid representation of their true abilities:

> *"They (meaning children) will produce for you the first morning, they will try very hard and they will work hard. But the second day they don't wantto do it. And, because the test is so long, the interest just starts to wane and they will just write anything, just to get it done. And so, it's too long ofa test and you're not really evaluating their abilities."* (Apples, Grade 3/4 Teacher)

This teacher indicated that the length of the test could be a serious threat to validity. The length of the test has been addressed over the years by EQAO, as the length of the test has been shortened since it was first administered in 1996. It is quite possible that the test is still too long

for younger students in Grade 3. While a shorter test is ideal in some cases, the literature provides contrary evidence which suggests that one of the testing programs‟ biggest difficulties is the limited number of test items. These concerns suggest the need for further research on the tests‟ psychometric properties.

Reliability was the second theme in the teachers‟ comments. Teachers believed that there were errors in measurement based on the test. For example, Freda, a Grade 2/3 teacher, felt that test administration was not standardized across schools:

> *I also find that there are too many variables that come into play from one school to another, so it‟s a barrier in terms of the results are skewed, because I‟ve heard that some schools give a lot of help to the students as the test goes on, and then others schools do what they‟resupposed to be doing, so I don‟t think that it‟s a very clear assessment.* (Freda, Grade 2/3 Teacher)

Marking the tests was another concern for teachers. For example, Maria, a Grade 6 teacher, stated that she would like to know more about how teachers marked the tests, the standards, and whether it was norm-referenced or criterion-referenced:

> *I would like to know exactly what they expect for an answer, whether it‟s inmath or in reading particularly, that‟s been out of focus lately and in writing they do give us an outline of what they‟relooking for but it‟s very basic, but I‟m still finding that I‟m teaching something and the results come back and I‟ve, you know if I‟ve scanned it over before I‟ve sent it in, and I‟ve thought well how did this child get a two, and I know if I‟d marked it would‟ve been a three, so I don‟t understand, there‟s no real standard. I‟ve heard from people that have been there where they tell them well you can‟thave too many level fours because it looks bad or you can‟t have too many level ones because it looks bad, so I don‟t know how true that is.* (Maria, Grade 6 Teacher)

The EQAO test is criterion-referenced, although the teacher‟s quote above indicates some hearsay about a possible norm-referenced approach to marking.

A few of the teachers mentioned how they perceived that different schools had an advantage over other schools, due to the financial compensation that was provided to them by the government as a result of previous test scores. The rationale was that resources were provided to certain schools that may have had room for improvement, in the aims of promoting equity. For

example, Donna a Grade 3 teacher provided her perceptions of the consequences of assessment outcomes:

> *As it stands, not every school has the same access to the same resources and that"s the kind of stuff that contributes to another flaw in the data again, we have schools in our own board here who are getting one hundred and fifty thousand dollars in literacy resources to help them support their kids for the EQAO and then you have a school like ours who are staying at a level three, which is good, but are we going down, no, we"re pretty much staying at a level three and are we getting any resources to bump us up to a level four? No. because we"redoing well, but if you"re doing poorly then you get a pat on the back and a hundred and fifty thousand to go and get resources and books and time off to meet with staff and all the other stuff that goes on with turnaround schools.* (Donna, Grade 3 Teacher)

Teachers" identified other issues which they felt led to the misrepresentation of student abilities, such as the inclusion of students with special needs in the school results report and student"s opportunity to learn. For example, the perceptions of Winny, a Grade 6/7 teacher, provided insights about teachers" concerns regarding the inclusion of students with varying abilities in the school results reports, which contributed to the misrepresentation of students" true abilities:

> *And then that doesn"t take into account the kids that have IEP"s that are at grade two or three level, and they can"t do things independently and that"s not fair on them, and it brings your scores down and you don"t take that into consideration when you"rereading the data maybe that you"ve had maybe all of these kids on IEP"s reading at a grade two level.* (Winny, Grade 6/7 Teacher)

Other comments about the EQAO program addressed the timing of the publication of results which negatively impacted its usefulness. These factors contributed to teachers" beliefs regarding the potential use of data to judge policies and implement planning.

In summary, teachers" assumptions and beliefs about the data generated from the EQAO assessment were that there were issues with both the validity and reliability of the test, which acted as a barrier to buying-in to the EQAO assessment program and which negatively impacted their use of the data which was generated. This finding is in keeping with the literature, which

suggests that educators‟ concerns about validity greatly affected individual buy-in for various data sources, which has been identified as an important factor affecting meaningful data use (Feldman & Tung, 2001; Herman & Gribbons, 2001; Ingram et al., 2004).

Question 3. What do teachers report as their perceived impacts (positive and negative), on students and teachers, of data generated from the provincial tests?

Teachers reported that the data generated from the EQAO assessment program had little impact upon students; however, their comments illustrated an impact of varying degrees upon teachers and their teaching practices.

About half of teachers‟ perceived that there was no impact of test scores upon students. Three teachers were unsure about the impacts of the data in the results reports upon students. The other teachers did not provide any comment about how the results of the tests impacted their students. The reasons that these teachers gave for there being no impact upon students was that the results came back too late, the students had already moved on to the next grade and did not care anymore since they wrote the test in the past. For example:

> *Because the test results aren‟t made public until October, the following year, usually around October, so those students are gone, the grade threes are in grade four, the grade sixes are in seven so it‟s umm, they have more of a been there done that attitude, so now that‟s it‟s over I don‟t think that they really look back.* (Scott, Grade 5/6 Teacher)

Another example is provided by the perceptions of Bounce a Grade 3 teacher, as she stated that she receives very little feedback from students:

> *I get very little feedback from the students from the next year that have gone on to grade four. Most of my students either achieve level three or four on their assessments, so I guess they‟recontent enough, I don‟t hear anything back but, for the students that do have difficulties, if there‟s anything done for them afterwards? Not that I‟ve ever heard of. So how does it impact my students overall? I don‟t think that there really is any impact; it‟s justsomething they have to do and move on.* (Bounce, Grade 3 Teacher)

Of the teachers who were unsure about how the test scores impacted students, some responded that they had not heard anything back from students. Winston a Grade 2/3 teacher

stated that she was unsure of how the data impacted students, because she was unsure if parents gave them the test results:

> *I don"t even know if the parents share the results with them and we don"t share that with them, it"s between the parents to decide to share that with their sons or daughters so it"s up to the parents, so they sometimes never know what they did and I don"t know if they ever will know. I tell my daughter, but that"s different.* (Winston, Grade 2/3 Teacher)

Teachers" perceptions regarding the impacts of data on their own practice were categorized into two categories: impacts on teacher teaching practices and impacts on teachers" knowledge of the curriculum. Most teachers perceived that the impact of data upon their teaching practices were large, some perceived the impacts as positive while others perceived the impacts as negative. A few teachers stated that their teaching was not impacted at all by the data. Some teachers stated that one negative impact was that they had to make adjustments to their teaching practice as a result of school board initiatives developed in response to low scores on the EQAO test. For example:

> *I wish it didn"t, but the schools and the board aren"t giving us any choice anymore, they, we have a practice booklet called a non negotiable, it"s yellow for grade six and so we"re told that it must be used it must be used this amount of times every week, so that has to impact my classroom because I have to use that one, I can"t be doing other things. I think they wanted about an hour a week, the other thing is that we have to have our kids doing what we call open response questions, to their reading and all the PLC"s are based around that right now that is tons of hours of teacher release time in PD"s and days in training and we always have to do it, another open response with our kids and bring the work to the PLC"s and go back and it really has become about teaching the kids how to write a good response, now there"s some reading skills in there but my feeling is the focus is totally flipped on how to write a good answer so we are teaching kids how to write the answer instead of teaching kids how to read.* (Cathy, Grade 5/6 Teacher)

Apples a Grade 3/4 teacher, stated that she perceived a large impact on her teaching of math, as she perceived there was less time for other subjects. This impact was negative in that it narrowed the variety of subjects that were taught, however it was positive in that she focused on literacy and numeracy:

It totally takes over your teaching practice, you have to teach to the test, it is something you have to start working on in September, so you totally plan around the test. You have to have your whole curriculum taught before the test so that you are a month short to start with, things like math, it really impacts, children have to retain and recall what you taught them in September, so you have to review. So you have to teach it in a shorter time plus review it. It makes you do less arts, less science, social studies because you really have to focus on literacy and numeracy. (Apples, Grade 3/4 Teacher)

The comments of Beany, a Grade 6 teacher, illustrated her perceptions of a large impact on her teaching practices as she limited the coverage of the curriculum to only teaching the required knowledge or expectations in the curriculum:

It probably impacts it quite greatly; I make sure that I cover what I know they"ll be testing. I check the expectations, if it"s not a grade six expectation then I don"t spend a lot of time on it so I don"t go beyond our required knowledge because there is enough of it to go over, to cover the curriculum before the testing takes place. I look at the types of questions that they ask on the test and make sure that the students are aware of those types of questions. I organize what we"reteaching throughout the year to make sure I"m taking into account the types of questions the EQAO will ask on the grade six test, I make sure that I cover the forms of writing I know are most often on the test, I make sure we deal and the children know how to answer open response questions, I also make sure that they know how to answer multiple choice questions, so that"s partof the teaching practice and planning, obviously before I teach it I plan it out, so EQAO type things are planned throughout my year and long ranged plans. Classroom management, they do somewhat impact my classroom management as I get the students used to working independently because they will be expected to do that independently. The types of strategies I use in my teaching are often impacted again by the types of things I"m teaching. (Beany, Grade 6 teacher)

Of the teachers who provided comments about the impacts of the assessment upon their knowledge of the curriculum, their comments suggested that there was indeed an impact. For example, some stated that they were more aware of what they had to teach, while others stated that it impacted their interpretation of the „important aspects" of the curriculum only. One example is provided by Caper a Grade 3 teacher, as she stated the only impact was upon her knowledge of ways to teach literacy:

I guess one way that it impacts me is that it makes me think of different ways to word questions when I"m making kids respond to text, so when I"m doing an open ended question I make sure that I have some of the vocabulary that the EQAO test has on it, so I

guess it changes that way I teach in some way. I definitely don"t teach to the test, I teach the curriculum and that"s whatI"mhere to do, I don"t teach to the test.

(I)So would you say that it does impact your knowledge of the curriculum?

Not content of curriculum, maybe literacy based content of the curriculum but nothing else. Because the test doesn"t do science or social studies, all it does is literacy and math, so does it help me teach math, no. Does it help me come up with different ways to word questions for language, yes. (Caper, Grade 3 Teacher)

Sassy, a Grade 6 teacher stated that one impact upon her knowledge is that it has helped her to strengthen her own knowledge and what she shares with her students in order to better prepare them:

Well I feel that it probably has helped me to strengthen the knowledge that I have because I am certainly cognizant of what I need to teach because I want my students to be well prepared. I have found that over the years I have certainly changed in my day to day sort of ideas that I share with them, I embed in my week and in my day different aspects of EQAO because I have given it quite a few years now. (Sassy, Grade 6 Teacher)

Donna, a Grade 3/4 teacher, identified an impact upon her knowledge of the curriculum in how she interpreted the curriculum and which aspects to focus on during teaching:

On my knowledge of the curriculum, I don"t know so much about knowledge, more interpretation of the curriculum, what they specifically are looking for, so it increases my knowledge of details in the curriculum that are deemed important, and so it does improve that because the test does focus on certain things, and so your knowledge increases because you are trained to teach that specifically, so it"s a broad curriculum and so it does increase your knowledge in specific areas. (Donna, Grade 3/4 Teacher)

In summary, the perceived impact of data generated from the provincial tests varied according to the individual teacher. Most teachers reported that there was a large and sometimes negative impact of data from the EQAO assessment upon their teaching practices. Many of the impacts upon teachers" teaching practices involved changes to their delivery of program and changes to the amount of time spent on certain subjects. Teachers reported that there were specific impacts on their pedagogical knowledge, such as impacts upon their interpretations of

the curriculum as well as their literacy based knowledge. Teachers perceived that there was little or no impact of the data directly upon students.

Question 4. What do teachers report about the timing and method of knowledge mobilization of provincial tests and its impact on their pedagogical knowledge and teaching practice?

Time was reported by teachers as one of the most prevalent issues affecting the mobilization of knowledge generated from the use of data from the EQAO provincial assessments. The current timing of the administration of EQAO as scheduled in late May and the receipt of test results in late September or early October was identified as a problem for most teachers.

Many of the teachers stated that the current timing of the administration of the EQAO test and the publication of results reports limited their use for improving teaching practices or developing teachers" knowledge. Teachers" comments illustrated a perceived detachment in time between the preparation, administration and publication of test results, which negatively impacted their use of data. Teacher"s reported that they spent the whole school year trying to cover the vast amount of curriculum, designed for a ten month school year, in a nine month time frame, as the EQAO test is administered in late May for most schools. Some of the teachers felt as though they could not "do justice" to teaching the curriculum and preparing their students in time for the EQAO assessment. For example:

> *I guess we as teachers have said that in grade six, we would really like, like wouldn"t it be nice it if we could have it actually at the end of the year, rather than at the end of May, because we feel that we have so much that we have to cover, especially in math curriculum over the year, and we feel that we have less of a year to teach all of those things that other teachers do at other grade levels, so we would love it if we could have them write right at the very end of the year, when we are no longer much dealing with curriculum and we have covered it all, we would certainly like that, as far as the timing goes. I find that it"s just very stressful trying to cover everything within the amount of time that we have, and there"s a lot of challenging concepts in grade six math and so it would be nice to have almost that extra month to have for them to cover that. So, I always feel like I never do it quite as much justice as I"d like.* (Sassy, Grade 6 Teacher)

> *I wish the test could be later in the year and that way you could cover everything and spend more time in covering the material, that"s probably my biggie.* (Rachel, Grade 3 Teacher)

Another issue mentioned by teachers was the actual amount of time that was necessary for the administration of the EQAO test. Some teachers felt that the three to five day sessions were too long for their students. Other teachers perceived that the three to five days in which the test was administered was contributing to their loss of valuable teaching time.

The teachers perceived that the results of the EQAO assessment could no longer apply to students, since so much time had elapsed since the test was written. Enough time had elapsed for students to change grades and to learn and develop, to a point where teachers perceived that the results no longer applied to those students. Although most teachers commented on the issue as being about time and the timing of the administration and publication of results, the issue was also presented by teachers in a way that made evident the relationship that the teachers had with each of their students, and how they believed in the unique identity of each student. This perception pertained to the individual learning needs of each student as well as the uniqueness of each class. Teachers reported that when it came time to use the data in the results reports, they did not feel that those data pertained to their current class which was a new group of kids.

A few teachers also reported that they did not have time to sit down and interpret the data in the results reports. Some of the reasons that teachers gave were that they did not have enough time to work at understanding what the data meant and that there was too much data. This finding was in keeping with the literature on data use and time, where a lack of time was highlighted as an obstacle to educators" use of data as evidence for improvement purposes (Supovitz & Klein, 2003; Wayman & Stringfield, 2006).

Question 5. How can knowledge mobilization about provincial testing be improved to better suit the needs of the elementary teachers?

The following changes to the activities within the EQAO assessment program as well as to the EQAO assessment tool were suggested by teachers. The gathering of teachers in a social context to discuss school results should continue, however, there may be other enablers (e.g., provision of training for teachers in quantitative methods) to include to the current context of data use, which may help mobilize knowledge gained from the data in the EQAO results reports.

Changes to the scheduling of administration of the test were suggested by teachers. Some teachers proposed that the test occur at the beginning of the school year, whereas others suggested that it be administered in smaller amounts, throughout the school year, while others suggested random sampling methods be used. For example, Caper a Grade 3 teacher, stated that it might help to have more frequently administered and shorter tests throughout the school year:

> *I just wish there was a better way to do it, than a snapshot of three mornings that we use here. Yeah, we should break it up into say the three math strands, every teacher should teach these three strands in math in September, October and November and these things in language, and then do a test. And then do it in term two and do a test, and do it in term three and do a test. Maybe that might be a way to do it.* (Caper, Grade 3 Teacher)

A similar comment was made by Apples a Grade 3/4 teacher, stated that frequent administration of smaller portions of the curriculum might be a better:

> *So, because it happens late in the year, you"renot going to have any impact on the children that you"retesting. I've never thought about if they"ve had it earlier and maybe only tested on a portion of the curriculum, but if they gave you until the end of January to teach a certain portion, tested the children, then you could use the test to say, ‚okay, this is what this child needs to do, they need improvement in these areas"and then use the rest of the year, that would make much more sense. But passing the children on to another grade, that teacher is not facing testing, so what is done with that information? Absolutely nothing.* (Apples, Grade 3/4 Teacher)

Bounce, a Grade 3 teacher, stated that a random sampling of students around the province might provide just as good of an indicator of student achievement:

> *I think, what I think is that all of these millions of dollars that are being spent on EQAO assessment, they could get the same results by doing random samplings around the province. Right now with the government"s website on schools and how each school has performed, I think that"sreally discriminatory and I think that that is really an invasion of*

> *privacy, and I think that if they do just do random sampling, train everybody to do the test, but just pick random classes around the province, you would probably get just as good of an idea of how students overall are doing, and it would cost a lot less.* (Grade 3 Teacher)

All of the teachers who administered the EQAO reported that they discussed the results in a social context. The social context was helpful to teachers as they interpreted the results and made decisions about school or division improvements for the school year. Besides the interchange of ideas and the gains in knowledge through the social context, the teachers used each other for support in regard to data analyses and interpretation, as well as the setting of targets, goals and long range plans for school improvement. This finding is consistent with literature on the importance of the social context and the transformation of knowledge (Earl & Timperley, 2008), where knowledge is created through dialogue which allows ideas to become explicit and available. It is through these interchanges that new ideas, tools and practices are created, as mutual knowledge is enriched and transformed during the process.

Teachers" needed to see the data as reflecting individual student achievement. Many of the teachers suggested that they gain access to the individual student results reports either via the provision of a hard copy or via access to the website. For example, Beany a Grade 6 teacher stated that she would like more information included in the results reports, and would like to have open access to the data:

> *It would be nice and this may change depending on the school you're in, I don't necessarily see the individual student reports that go home with them, because it's sometimes sent home without my knowledge, so having that might be helpful. More school reports by types of questions, such as open response questions, are they doing well on, because they (EQAO) break it down into the four areas that they are assessing especially the math, knowledge, understand, communication, application, so seeing those areas would be good and the same with the school board results, by type of question…That goes along with the one before, so possibly allowing individual teachers having individual access to, not so much that I need to know how Johnny, from last year is now doing, now that he's left my classroom, but class, wide results to see that as I said before we've focused on an area of writing and they've done better in that area of writing or we've focused on giving them a formula for answering open response and they've done better at*

that, would be helpful to know, but how to communicate, there is a website but I don't have access to the reporting on that, you have to be a principal or higher, that I know of. (Beany, Grade 6 Teacher)

The shortage of individual student scores may contribute to teachers" deficiency of data use, which is in keeping with educational research which documents a lack of access to appropriate data as a barrier to the use of data by educators (Kerr et al., 2006).

Other teachers have commented about the inclusion of more information about the test questions in the results reports, so that they can have a better idea of the needs of the students. For example, Winny a Grade 6/7 teacher, when asked about a better way to communicate the data in the results, suggested that more description of item content would be helpful:

Yes, because the way that they have it back, they give it to us, they just tell us what questions they are, like the question numbers, and then they tell us the scores, they don't actually give us the questions. And we're not allowed to look at the test we're not allowed to open the tests until the day of, so we have no idea what's on the test until that day. We can't even keep a test so that we can look at the test later on, all that we get in the results with the question number, and then we have to figure out, and it takes a long time to go through that and we spend the first couple staff meetings going through what kind of question was it, was it explicit, was it implicit, was it making connections, was it this, was it that, what kind of math question was it?

(I)That's interesting, so what could they do differently?

They could give us the test, just plain and simple, if they can give us a copy of the test with the results and then it would be so much easier to compare and do it, instead of taking two staff meetings just to interpret the data. (Winny, Grade 6/7 Teacher)

A few teachers" comments suggest that they did not understand the data in the results reports and that they may benefit from receiving further guidance from administrators on the interpretation of the data in the reports, or from the receipt of training on quantitative analyses, or from the provision of „next steps" for practice.

Guidance from administrators when discussing the data in the results reports may help teachers to interpret and apply the information gained from those data. For example, Maria stated

that she does not know how to use the data in the results reports and that the administrators at her school did not explain to the teachers what the data meant:

> *But they never explained anything, so again, it"s hard to decipher some of the information they get.*
>
> (I)In the results reports?
>
> *Yes. So, I don"t know, I don"t know how to use it sometimes.* (Maria, Grade 6 Teacher)

Training on quantitative analyses was indirectly suggested by teachers, as supported by the above quote and by the following quote which depicts one teachers" lack of mathematical skills and capacity to understand and interpret the data in the reports:

> *My skills are limited because I"m not a mathematician and statistically, those graphs come out as bar graphs and all of that and I don"t have enough time to view them and absorb how that should impact on my daily teaching, or long term, you know, a few months in advance, or next term, what to do, as well, things like only getting the data say in bar graphs and all these big statistical sheets at a staff meeting, it"s almost pushed aside after, unless a principal or division leader gives you specific instructions and points something out and says ,,your low on this, 1.3, you need to work on that this year".*
>
> (I)And do they do that?
>
> *They will pin one or two and that usually drives our school based smart goal, so it"s all this very convoluted paperwork trail.* (Piama, Grade 2/3 Teacher)

Next steps are suggested as being included in the school results reports, which may help to increase teachers" capacity to analyse and apply their knowledge gained from working with the data in the result reports. For example:

> *I really don"t get, the information does not really impact on my teaching practice.*
>
> (I)So if you think back to seeing the results from EQAO, I"m wondering what kinds of information can they give back to you, is there any information that you"re not receiving that might help more?
>
> *It"s left to us to analyse the data, and perhaps if they had a component in there that said ,,well, if you"rescores are low here, your next steps are", in our practice we do next steps, maybe they could give us some next steps and say ,,if your low in this section try this, if your low in that then try this"that would be helpful.* (Apples, Grade 3/4 Teacher)

These comments suggest that teachers may benefit from participating in training sessions on the topic of data use and that they may also need more guidance from administrators about how to understand and interpret the data in the EQAO results reports. This finding is supported by educational research which suggests that teachers‟ lack of quantitative prowess is a barrier to data use and which identifies educators as having difficulty with formulating research questions, the interpretation of results, and effectively developing and using assessments (Choppin, 2002; Dembosky, Pane, Barney, & Christina, 2005; Feldman & Tung, 2001; Herman & Gribbons, 2001; Mason, 2002).

In summary, there were many changes suggested both directly and indirectly by teachers about the EQAO assessment program that will better suit their needs and help to mobilize knowledge gained from data in the results reports. The comments from teachers demonstrated that there is room for improvement in the EQAO assessment program. Teachers‟ comments suggested the following amendments to the EQAO assessment program, such as: the provision of the individual student results reports, the provision of additional test item information and continuous access to data in the results may help teachers use data from the EQAO assessment program. Teachers‟ comments also suggested that some teachers do not know how to interpret data in the results reports, and that further support and training may be helpful, such as; the provision of next steps, guidance from administrators or participation in professional development (PD) opportunities on the topic of data analysis.

CHAPTER FIVE: CONCLUSIONS

The EDIM framework was a useful conceptual framework through which to examine teachers‟ perceptions of data use. The layout of the structure was revised following the analysis of data from this study. Certain stakeholder groups and elements were added within the main constructs to illustrate their importance within those contexts. The processes and activities in the EQAO program, as well as the roles and responsibilities of teachers among other stakeholders, fit the structure of the revised EDIM conceptual framework. The main elements of the revised EDIM were the context of data production, the context of data use, time and the social context.

Teachers‟ assumptions and beliefs about the data generated from the EQAO assessment included issues with the validity and reliability of the test, which were a barrier to buying-in to the EQAO assessment program and negatively impacted their use of the data. Teachers‟ perceptions about the impacts of data varied upon teachers‟ pedagogical knowledge and their teaching practices. Most teachers reported a large and sometimes negative impact of data upon their teaching practices which involved changes to their delivery of program and changes to the amount of time spent on certain subjects. Teachers reported that there were specific impacts on their pedagogical knowledge, such as changes regarding their interpretations of the curriculum as well as their literacy based knowledge. Teachers perceived that there was little or no impact of the data directly upon students.

Teachers‟ comments depicted time as a barrier of their use of data while the social context was depicted as a facilitator. Teachers‟ statements described the social context in which they discussed the interpretation of data and the implementation of knowledge gained as being helpful to their use of data. Most teachers suggested that they continue to discuss and interpret the data in the results reports, together, among other educators. Time and the timing of the

EQAO assessment was viewed by teachers as a barrier which impacted different aspects of the EQAO assessment program, such as the amount of time spent during administration of the EQAO test and the amount of time that passed for the marking of tests, as well as the amount of time spent interpreting the data in the results reports, which negatively impacted their use of the data in the results reports. Teachers stated that they believed the data in the school results reports no longer pertained to their current classes, which was a new group of students. Some teachers suggested that grade 4 and 7 teachers were responsible for implementing their knowledge gained from the data in the school results reports towards their classroom practices.

Teachers‟ comments suggested the following amendments to the EQAO assessment program which will aid their use of data, such as: the provision of the individual student results reports, the provision of additional test item information and continuous access to data in the results. Teachers‟ comments also suggested that some teachers do not know how to interpret data in the results reports, and that further support and training may be helpful, such as; the provision of next steps, guidance from administrators or participation in professional development (PD) opportunities on the topic of data analysis.

Recommendations

Based on the findings of this study, I recommend the following:

(1) Continue to evaluate the EDIM framework as a useful way to structure our understanding of Ontario‟s provincial assessment program through obtaining feedback from elementary teachers via a larger sample size. The use of multiple research methods, such as structured interviews and the circulation of a survey instrument to a larger sample of elementary teachers in grades 3, 4, 6 and 7 throughout Ontario, will provide further insights and

information on the current status of knowledge mobilization and the use of data within the EQAO assessment program by teachers for improvements and enhanced student learning.

(2) Investigate the implications of changes to both the timing of the administration of the EQAO assessment as well as the publication of results reports, to better reflect the timing of the school year and enhance usability of the data.

(3) Continue to enhance the social context in which teachers and administrators discuss the data in the results reports, as it is one element that supports teachers‟ understanding and use of data as well as increases the likelihood of the mobilization of that knowledge gained.

(4) Consider professional development (PD) opportunities for teachers on the topic of data analyses, which will enhance human capacity and enable teachers‟ understanding and interpretation of the data in the EQAO results reports.

(5) Consider the various suggestions by teachers about the EQAO assessment program, such as providing teachers with access to the individual student results reports as well as school results reports throughout the school year, or the use of alternate random sampling methods, among other suggestions outlined.

(6) Explore what is needed to best help teachers use the EQAO assessments in order to support school improvement efforts.

Implications

Teachers

The social context underlying the large scale assessment program is important as it relates to and supports the context of data production and data use. Support for teachers is necessary for enhancing the social context as teachers have suggested that the social context facilitates their production and use of data. For example, several teachers commented on the

importance of professional learning communities (PLCs) and leadership as important components of the social context in which they interpreted and used data for enhancing student learning.

A result of the study suggested that time was important as it impacted key components of the EDIM, such as the production and use of data. Challenges related to time included ensuring that student had an opportunity to learn the curriculum expectations in advance of the test and the timely interpretation of results reports for improvements. Continuing support for teachers is required as they work to manage challenges related to time.

Students

The implications for students are most linked to the context of data production, as students ultimately produce the data. Time of year and the time allowed to write the test were both raised by teachers as potential issues affecting students when writing the exam. Some teachers felt that these concerns were significant enough to affect the validity of interpretations based on test results. Teachers commented less frequently on the impact of the use of large scale assessment data on their students. There were mixed results regarding the impact of using the data for improvements to student learning: a few teachers used the data to directly inform their own classroom practices, while most teachers used it while setting school level goals. It‟s interesting to note that teachers‟ comments about the social context were not strongly related to comments about students. This raises the question about the role of students in the EQAO assessment program and their relationship with the social context. .

Testing Agencies

Testing agencies can consider the key components of the EDIM, such as the production and use of data, as well as other components that were important to teachers, such as time and

the social context, during decision making for program improvements. Testing agencies can also (a) consider multiple stakeholder perspectives as they continue to collect evidence of validity and (b) work to improve communication among stakeholders about EQAO test results and most importantly the best use of test results.

Limitations of the study

(1) The results and findings from the study are specific to Grade 3 and 6 teachers in North western Ontario who participated in this study, and may not be generalizable to other teachers from other grades or locations.

(2) Social desirability may affect teachers‟ responses to interview questions. Teachers may respond in a manner that will be viewed favourably by others, for example the researcher or other educators or political groups to which they belong.

(3) Male elementary teachers were under represented in the study. Female teachers are predominant in the elementary grades and therefore, the perceptions of male teachers are not represented in the study. A sample consisting of 15 male teachers would shed some light on any differences in the experiences of male and female teachers.

(4) Member checks post-analysis or follow-up interviews were not conducted, which would have contributed to the standing of the results.

REFERENCES

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (1985). *Standards for educational and psychological testing.* Washington, DC: Authors.

Aroni, R., Goeman, D., Stewart, K., Sawyer, S., Abramson, M., Thien, F., et al. (1999, July). Concepts of rigour: When methodological, clinical and ethical interests interact. Paper presented at the First AQR Conference, Melbourne, Australia. Retrieved from: http://www.latrobe.edu.au/aqr/offer/papers/RAroni.htm

Beadsworth, A.D., Keil, E.T. (1992). The vegetarian option: varieties, conversions, motives and careers, *The Sociological Review*, 40(2), 253-93.

Bernhardt, V.L. (2003). No Schools Left Behind. *Educational Leadership*, 60(5), 26-30.

Beyer, J.M., & Trice, H.M. (1982). The Utilization Process: A Conceptual Framework and Synthesis of Empirical Findings. *Administrative Science Quarterly*, 27(4), 591-622.

Boggs, J.P. (1992). Implicit Models of Social Knowledge Use, in *Knowledge, Creation, Diffusion, Utilization*, 14(1), 29-62.

Bolam, R., & Weindling, D. (2006). *Synthesis of research and evaluation projects concerned with capacity-building through teachers" professionaldevelopment.* London: GTC.

Boyatzis, R. (1998). *Transforming qualitative information: Thematic analysis and code development.* Thousand Oaks, CA: Sage.

Brown, J. S., & Duguid, P. (1991). Organizational learning and communities of practice: Toward a unified view of working, learning, and innovation. *Organizational Science*, 2(1), 40-57.

Cattell, R.B. (1966a). *The scientific analysis of personality*. Chicago: Aldine.

Cattell, R.B. (1966b). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245-276.

Chen, E., Heritage, M., Lee, J. (2005). Identifying and Monitoring Students" Learning Needs with Technology. *Journal of Education for Students Placed at Risk*, 10(3), 309-332.

Childs, R.A. (2009). When the Teacher is the Test Proctor, *Canadian Journal of Education*, 32(2), 618-651.

Childs, R.A., Lawson, A. (2003). What do teacher candidates know about large-scale assessments? What should they know? *Alberta Journal of Educational Research,* 49(4), 354-367.

Choppin, J. (2002, April). *Data use in practice: Examples from the school level.* Paper presented at the annual meeting of the American Education Research Association, New Orleans.

Coburn, C.E. (2001). Collective Sense-making about reading: How teachers mediate reading policy in their professional communities. *Educational Evaluation and Policy Analysis*, 23, 145-170.

Coburn, C.E., & Talbert, J.E. (2006). Conceptions of Evidence Use in School Districts: Mapping the Terrain. *American Journal of Education*, 112. 469-495.

Coburn, C.E., Toure, J., & Yamashita, M. (2009). Evidence, Interpretation, and Persuasion: Instructional Decision Making at the District Central Office. *Teachers College Record*, 111(4), 1115-1161.

Cohen, L.H., (1979). The Research Readership and Information Source Reliance of Clinical Psychologists, *Professional Psychology*, December 1979, 780-785.

Copland, M. (2003). Leadership for Inquiry: Building and Sustaining Capacity for School Improvement. *Educational Evaluation and Policy Analysis*, 25(4), 375-395.

Corcoran, T., Fuhrman, S.H., & Belcher, C.L. (2001). The District Role in Instructional Improvement. *Phi Delta Kappan*, 83, 78–84.

Cordingley, P. (2008). Research and evidence-informed practice: focusing on practice and practitioners. *Cambridge Journal of Education*, 38(1), 37–52.

Cordingley, P., Bell, M., Thomason, S., & Firth, A. (2005). The impact of collaborative continuing professional development (CPD) on classroom teaching and learning. Review: How do collaborative and sustained CPD and sustained but not collaborative CPD affect teaching and learning? In Research evidence in education library. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

Crabtree, B., & Miller, W. (1999). A template approach to text analysis: Developing and using codebooks. In B. Crabtree & W. Miller (Editions.)., *Doing qualitative research* (pp. 163-177.) Newbury Park, CA: Sage.

Deci, E., & Ryan, R. (1987). The support of autonomy and control behavior. *Journal of Personality and Social Psychology*, 53, 1024-1037.

Dembosky, J.W., Pane, J.F., Barney, H., & Christina, R. (2005). *Data driven decision makingin southwestern Pennsylvania school districts.* Santa Monica, CA: RAND.

Department of Education, Training and Youth Affairs (DETYA) Higher Education Division. (2000). The Impact of Educational Research: Research Evaluation Programme. DETYA No. 6646.HERC00A. ISBN 0 642 44516 8 (Internet copy).

Earl, L., & Timperley, H. (2008). *Professional Learning Communities: Challenges in using evidence for improvement.* New York: Springer.

Education Quality and Accountability Office, (2009-2010). *Agency Report: Driving Purposeful Improvement.* Queen‟s Printer for Ontario. Retrieved September 21, 2010, from http://www.eqao.com/pdf_e/10/Cagr_ne_0610_web.pdf.

Feldman, J., & Tung, R. (2001). Whole School Reform: How Schools Use the Data-Based Inquiry and Decision Making Process. Paper presented at the annual meeting of the American Educational Research Association, Seattle, April.

Fullan, M. G. (1992). Successful School Improvement: The Implementation Perspective and Beyond. Modern Educational Thought. Open University Press, Bristol, PA 19007-1598 (paperback: ISBN-0-335-09575-5; hardcover: ISBN-0-335-09576-3).

Garcia, E., (2004). *Keywords Co-Occurrence and Semantic Connectivity: An Introductory Series on Co-Occurrence Theory for Information Retrieval Students and Search Engine Marketers* Retrieved from website: http://www.miislita.com/semantics/c-index-1.html. Last Update: 06/28/05

Green, S.K., Johnson, R.L., Kim, D.H., & Pope, N.S. (2007). Ethics in classroom assessment practices: Issues and Attitudes. *Teaching and Teacher Education*, 23 (7), 999-1011.

Guskey, T.R. (1986). Staff development and the process of teacher change. *Educational Researcher*, 15(5), 5–12.

Guskey, T.R. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press Inc.

Hargreaves, D.H. (1993). A common-sense model of the professional development of teachers. In Elliott, J. (Ed.), Reconstructing teacher education. London: Falmer.

Heritage, M., & Chen, E. (2005). Why Data Skills Matter In School Improvement, *Phi Delta Kappan*, 86(9), 707-710.

Herman, J., & Gribbons, B. (2001). Lessons Learned in Using Data to Support School Inquiry and Continuous Improvement: Final Report to the Stuart Foundation. National Centre for Research on Evaluation, Standards, and Student Testing, Los Angeles.

Honig, M., & Coburn, C. (2008). Evidence-Based Decision Making in School District Central Office: Toward a Policy and Research Agenda. *Educational Policy*, 22(4), 578-608.

Hopkins, D., & Reynolds, D. (2001). The Past, Present and Future of School Improvement: Towards the Third Age. *British Educational Research Journal,* 27(4) *Educational Effectiveness and Improvement: Developing New Theories and Methods,* 459-475

Hultman, G., & Horberg, C. (1995). Teachers' informal rationality: Understanding how teachers utilize knowledge. *Science Communication*, 16(3), 337-350.

Johnson, J.H. (1997). Data-Driven School Improvement. ERIC Digest, no.109.

Joyce, B., & Showers, B. (1988). *Student achievement through staff development*. New York: Longman.

Kane, M.T. (2006). Validation. In R.L. Brennan (Ed.), Educational measurement (4th ed.) (pp.17-64). Westport: CT: American Council on Education/Praeger Publishers.

Keeney, L. (1998). Using Data for School Improvement: Report on the Second Practitioners" Conference for Annenberg Challenge Sites. Annenberg Institute for School Reform, Providence, RI.

Kennedy, M.M. (1982). Working Knowledge and other Essays. Cambridge, MA: The Huron Institute.

Kerr, K.A., Marsh, J.A., Ikemoto, G.S., Darilek, H., &Barney, H. (2006). Strategies to Promote Data Use for Instructional Improvement: Actions, Outcomes, and Lessons from Three Urban Districts. *American Journal of Education,* 112, 496-520.

Klinger, D.A., Rogers, W.T., Anderson, J.O., Poth, C & Calman, R. (2006). Contextual and School Factors Associated with Achievement on a High-Stakes Examination, *Canadian Journal of Education,* 29(3), 771-797.

Koch, T. (1994). Establishing rigour in qualitative research: The decision trail. *Journal of Advanced Nursing*, 19, 976-986.

Lachat, M.A. (2001). Data-Driven High School Reform: The Breaking Ranks Model. Providence RI. Northeast and Islands Regional Educational Laboratory at Brown University.

Lachat, M.A., & Smith, S. (2005). Practices that Support Data Use in Urban High Schools. *Journal of Education for Students Placed At Risk*, 10(3), 333-349.

Landry, R., Amara, N., Lamari, M. (2001). Utilization of social science research in Canada. *Research Policy,* 30, 333-349.

Lavis, J.N. (2006). Research, Public Policymaking, and Knowledge-Translation Processes: Canadian Efforts to Build Bridges. *The Journal of Continuing Education in the Health Professions*, 26(1), 37–45.

Lavis, J., Ross S., Hurley, J., Hohenadel, J., Stoddart, G., Woodward, C., & Abelson, J. (2002). Examining the role of health services research in public policy making. *Millbank Quarterly,* 80(1), 125- 154.

Levin, B. (2004). Making Research Matter More. *Education Policy Analysis Archives*, 12(56), 1-20.

Levin, B. (2008). *Thinking About Knowledge Mobilization.* Paper prepared for symposium sponsored by the Canadian Council on Learning and the Social Sciences and Humanities Research Council of Canada, 15-18 May.

Leinder, R., Leidner, R. (1993). *Fast Food Fast Talk: Service Work and the Routinization of Everyday Life*. University of California Press, Ltd. London, England. ISBN: 0-520-08500-0. Retrieved from: http://www.flipkart.com/book/fast-food-talk-robin-leinder/0520085000#previewbook

Linn, R. L. (1998). Partitioning responsibility for the evaluation of the consequences of assessment programs. *Educational Measurement: Issues and Practice*, 17(2), 28-30.

Lindblom, C. (1990). *Inquiry and change*. New Haven: Yale University Press.

Love, N. (2004). Taking Data to New Depths. *Journal of Staff Development*, 25(4), 22-6.

Love, J.M. (1985). Knowledge Transfer and Utilization in Education. *Review of Research in Education,* 12, 337-386.

Mason, S. (2002). Turning data into knowledge: Lessons from six Milwaukee public schools. Wisconsin Center for Education Research. Retrieved from: www.wcer.wisc.edu/archive/mps/AERA2002/Mason%20AERA%202002%20QSP%20Symposium%20Paper.pdf

McMeniman, M., Cumming, J., Wilson, J., Stevenson, J., & Sim. C. (2000). Teacher knowledge in action. Included in *The Impact of Educational Research Report*, by the Department of Education, Training and Youth Affairs (DETYA), 375-550.

Merriam, S.B. (1998). *Qualitative Research and Case Study Applications in Education.* Jossey-Bass Inc., Publishers, San Francisco, CA.

Mieles, T., & Foley, E. (2005). *From Data to Decisions: Lessons from School Districts using Data Warehousing*. Providence. RI: Annenburg Institute for School Reform.

Mitchell, C. (1999). Building learning communities in schools: The next generation or the impossible dream? *Interchange*, 30(3), 283-303.

Murnane, R.J., Sharkey, N.S., Boudett, K.P. (2005). Using Student Assessment Results to Improve Instruction: Lessons from a Workshop. *Journal of Education for Students Placed at Risk*, 10(3), 269-280.

NEA Foundation for the Improvement of Education, (2003). *Using Data about Classroom Practice and Student Work to Improve Professional Development for Educators.* Washington, DC: NEA Foundation for the Improvement of Education.

Nutley, S., Walter, I., & Davies, H. (2003). *From Knowing to Doing: A Framework for Understanding the Evidence-Into-Practice Agenda*. SAGE Publications (London, Thousand Oaks and New Delhi) [1356–3890 (200304)9:2; 125–148; 034310]. 9(2), 125–148.

Ontario Neurotrauma Federation, Retrieved from website: http://www.onf.org/knowledge/glossary.htm

Owen, J.M. & Rogers, P. (1999). *Program Evaluation: Forms and Approaches,* Second Edition, Sage, London.

Pajares, M.F., (1992). Teachers' Beliefs and Educational Research: Cleaning up a Messy Construct. *American Educational Research Association*, 62(3), 307-332.

Patton, M. (2002). *Qualitative research & evaluation methods* (3rd Edition.)., Thousand Oaks, CA: Sage.

Pelz, D.C. (1978) Some expanded perspectives on use of social science in public policy. Pp. 346-57 in J. M. Yinger and S. J. Cutler (eds.), *Major Social Issues: A Multidisciplinary View*. New York: Free Press.

Popham, W. James. (1995). *Classroom Assessment: What Teachers Need to Know.* Needham Heights, MA: Allyn & Bacon.

Porac, J.F., Thomas, H., & Baden-Fuller, C. (1989). Competitive groups as cognitive communities: The case of Scottish Knitwear manufacturers. *Journal of Management Studies*, 26, 397-416.

Printy, S.M. (2008). Leadership for Teacher Learning: A Community of Practice Perspective. *Educational Administration Quarterly,* 44(2), 187-226.

Research Impact – turning research into action, (2006), website sponsored by York University and the University of Victoria, http://www.researchimpact.ca/faqs/.

Rice, P., & Ezzy, D. (1999). *Qualitative research methods: A health focus.* Melbourne, Australia: Oxford University Press.

Social Sciences and Humanities Research Council of Canada, (2007). Knowledge Impact in Society: A SSHRC Transformation Program. Retrieved from website: http://www.sshrc-rsh.gc.ca/web/apply/program_descriptions/knowledge_impact_e.asp, 3/12/2008.

Shulman, L. (1987), „Knowledge and teaching: Foundations of the new reform" *Harvard Educational Review*, 57, pp. 1–22.

Spillane, J.P. (1998). State policy and the non-monolithic nature of the local school district: Organizational and professional considerations. *American Educational Research Journal*, 35, 33-63.

Starbuck, W.H., & Miliken, F.J. (1988). Executives" perceptual filters: What they notice and how they make sense. In D.C. Hambrick (Edition.), *The executive effect: Concepts and methods for studying top managers* (pp.35-65). Reenwich, CT: JAI Press.

Stein, M. K., & Brown, C. A. (1997). Teacher learning in a social context: Integrating collaborative and institutional processes with the study of teacher change. In E. Fennema & B. S. Nelson (Eds.), *Mathematics teachers in transition* (pp. 155-191). Mahwah, NJ: Lawrence Erlbaum.

Stein, M. K., Silver, E. A., & Smith, M. S. (1998). Mathematics reform and teacher development: A community of practice perspective. In J. G. Greeno & S. V. Goldman (Editions.), *Thinking practices in mathematics and science learning* (pp. 17-52). Mahwah, NJ: Lawrence Erlbaum.

Stevens, J.P. (1999). *Applied multivariate statistics for the social sciences* (3rd Edition.)., Mahwah, NJ: Lawrence Erlbaum Associates.

Stiggins, R. (1997). *Student-Centered Classroom Assessment*. (2nd Edition.)., Upper Saddle River, NJ: Prentice-Hall.

Stringfield, S., Jeffrey C. Wayman, and Yakimowski, M. (2005). "Scaling Up Data Use in Classrooms, Schools, and Districts." In *Scaling Up Success: Lessons Learned from Technology-Based Educational Innovation*, ed. C. Dede, J. Honan, and L. Peters. San Francisco: Jossey-Bass.

Supovitz, J. A. (2002). Developing communities of instructional practice. *Teachers College Record*, 104(8), 1591-1626.

Supovitz, J.A., & Klein, V. (2003). *Mapping a Course for Improved Student Learning: How Innovative Schools Systematically Use Student Performance Data to Guide Improvement*. Report, Consortium for Policy Research in Education. Philadelphia.

Sutherland, S. (2004). Creating a culture of data use for continuous improvement: A case study of Edison project school. *American Journal of Evaluation*, 25, 277-293.

Syed-Ihksan, S. & Rowland, F. (2004). Knowledge management in a public organization. *Journal of Knowledge Management*, 8(2), 95-111.

Thomas, K.W., & Tymon, W.G., (1982). Necessary properties of relevant research: Lessons from recent criticisms of the organizational sciences. *Academy of Management Review*, 7, p. 345-352.

Timperley, H., Fung, I., Wilson, A., & Barrar, H. (2006). Professional learning and development: A Best Evidence Synthesis of impact on student outcomes, Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA, April 7–11.

Vaughan, D. (1996). *The Challenger launch decision: Risky technology, culture, and deviance at NASA*. Chicago. University of Chicago Press.

Watson, J. (2002). "QSP and the MSP Information System." Paper presented at the annual meeting of the American Educational Research Association, New Orleans, April 1–5.

Wayman, J.C., & Stringfield, S. (2006). Data Use for School Improvement: School Practices and Research Perspectives. *American Journal of Education*, 112, 463-468.

Wayman, J.C., Midgley, S & Stringfield, S. (2005). "Collaborative Teams to Support Data-Based Decision Making and Instructional Improvement." Paper presented at the annual meeting of the American Educational Research Association, Montreal, April.

Weick, K. (1988). Enacted sensemaking in crisis situations. *Journal of Management Studies*, 25, 305-317.

Weick, K. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Sciences Quarterly*, 38, 628-652

Weick, K (1995). *Sensemaking in Organizations*. Thousand Oaks, CA: Sage.

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the Process of Sensemaking. *Organization Science*, 16(4), 409-421

Weiss, Carol H. (1979). The many meanings of research utilization. *Public Administration Review*, 39(5): 426-431.

Willinsky, J. (2003). Policymakers' online use of academic research. *Education Policy Analysis Archives*, 11(2). Retrieved from http://epaa.asu.edu/epaa/v11n2/.

Wingens, M., (1993). Towards a General Utilization Metaphor. A Systems Theory Reformulation of the Two-Communities Metaphor, *Knowledge: Creation, Diffusion, Utilization*, 12(1), 27- 42.

Young, V. (2006). Teachers" Use of Data: Loose Coupling, Agenda Setting, and Team Norms, *American Journal of Education*, 112, 521-548.

APPENDICES

Appendix A

Table 7

Interview Questions and links to the Education Data Issues Model (EDIM)

Interview Questions	Data Production	Social Context	Mediators	Time	Data Use
1) Have you received any special training from your Board regarding EQAO, and/or been a moderator for EQAO? If yes – over how many years?	✓		✓		
2) What do you consider the primary purposes of the EQAO assessments?	✓				✓

	Data Production	Social Context	Mediators	Time	Data Use
3) How do the EQAO assessments impact your knowledge of the curriculum?					✓
4) How do the EQAO assessments impact your teaching practice, in terms of organization, planning, and teaching strategies?	✓			✓	✓
5) How do the EQAO assessments impact your students during the preparation, writing and receipt of test results?	✓			✓	
6) How do you view your own ability to use the data in the results?					✓

	Data Production	Social Context	Mediators	Time	Data Use
7) What are some barriers that make the EQAO assessments difficult to use?				✓	✓
8) What are some facilitators that make the assessments easy to use?					✓
9) Do you interpret the data in the results of the assessments among other educators in a social context, during staff/division meetings or PLC"s?		✓			
10) Do any mediators such as the media, think tanks, policy people, lobbyists, have influence on how to interpret the data?			✓		

	Data Production	Social Context	Mediators	Time	Data Use
11) What do you think about the scheduling of the assessments?				✓	
12) What do you think about the timeliness of the publication of results?				✓	
13) Does the scheduling and/or timing of the assessments and the timeliness of the publication, impact their usefulness and how?				✓	
14) Do you get enough information back in the Student, School and School-Board Reports, to effectively improve your practice?					✓

	Data Production	Social Context	Mediators	Time	Data Use
15) In your opinion is there a better way to communicate the data in the results?					✓
16) How would you change the EQAO assessments to better suit your needs?	✓	✓	✓	✓	✓

Appendix B

Table 8: Revised Code Manual

Code	Relates to what part of the EDIM?	Descriptions/Notes
Context of Data Production	Context of data production	This code is applied to quotes that refer to the context of data production such as, the government who funds large scale assessment, professional development or training for teachers, the preparation of students, the administration and marking of assessments.
Context of Data Use	Context of data use	This code is applied to quotes that refer to the context of data use and applies to instances such as, training for teachers on data use, educators‟ use of data for decision making purposes and instances where students and parents use data from assessments.
Students	Context of data production, Context of data use	This code is applied to quotes that pertain to students and their roles within the EQAO assessment program, for example students were referred to by teachers in reference to the preparation and administration of the EQAO test.
Time	Time	This code is applied to quotes that refer to time or timing issues related to any of the elements in the EDIM.
Human Capacity	Context of data use, Social context	This code is applied to quotes that refer to educator‟s capacity to interpret data and effectively use assessment results. Training models include structured approaches to dialogue about data, that use educators‟ own real-life data issues and school challenges.
Social Context	Social context	This code is applied to quotes that refer to the social context, for example, instances where educators come together as a group, examples of school cultures, current issues, preoccupations, popular prejudices and ways of thinking.
Ways of Thinking	Context of data use, Context of data production Time	This code is applied to quotes that illustrate teachers‟ ways of thinking, for example, teachers who adhere to a way of thinking which does not support the use of data as a potential resource of knowledge used for decision-making will not buy-in to the processes or activities inherent in the production and use of data.
Teachers	Context of data production, Context of data use, Time	This code is applied to quotes that pertain to teachers, and their roles within the EQAO assessment program, for example, teachers referred to themselves and their roles during the preparation and administration of the EQAO assessment.
Impact Teaching	Context of data production, Context of data use	This code is applied to quotes that illustrate impacts (positive or negative) on teachers‟ teaching practices, for example prior to the EQAO test administration teachers may review curriculum that was taught at the beginning of the school year, so that students memories are refreshed.
Mediators	Mediators, Context of data use, social context	This code is applied to quotes that refer to mediators which link data production and use, for example, third party mediators like experts in data interpretation, educational leaders, teachers, principals and the media.

Barrier	Context of data production & data use, Time	This code is applied to quotes that depict any obstacles or impediments that pose difficulty to teachers during any part of the EQAO program.
School Cultures	Context of data production & use, Social context,	This code is applied to quotes that refer to the context where educators learn and work. For example, there are various pressures and supports available for educators within their schools and districts in terms of data use, which in turn, influences how educators perceive and use data. The motivations experienced by educators for the use of data may also depend on the educator‟s school community.
Organizational Factors	Social context, Context of data production & use	This code is applied to factors within educational organizations, such as factors within divisions, schools, the school board and the ministry of education.
Developing Analytical Capacity	Context of data use	This code is applied to the process where together (through participation in staff meetings, PLC‟s or PD on data use), educators work to develop their analytical abilities in order to understand data and apply it strategically. This includes actions of educators such as learning how to frame questions, selecting appropriate data and creating focused inquiries.
Current Issues	Context of data production, Social context	This code is applied to quotes that depict public discussion about student learning and the quality of the education system, usually as a result of the accountability system initiatives in which data use and large scale assessment is a part.
Facilitators	Context of data production	This code is applied to quotes that illustrate catalysts within any part of the EQAO program, for example, during test administration students are allowed scribes who enable student‟s ability to write the EQAO test, which also indirectly facilitates the production of data.
Government	Context of data production	This code is applied to quotes which depict the government‟s role in the EQAO assessment program, for example most comments pertain to the funding from the government (or ministry of education that is funded by the government).
Impact Knowledge	Context of data production	This code is applied to quotes that exemplify impacts (positive or negative) on teachers‟ knowledge and can pertain to the curriculum, to student learning among others.
Strategically Applying Knowledge from Data	Context of data use, Social context	This code is applied to quotes which demonstrate educators‟ ability to make purposeful and ethical use of information derived from data by applying information to targeted issues - for improving teaching and learning, for example if the students scored low on a certain section – such as open response questions, teachers would spend more time and energy teaching students how to answer open response questions.
Media	Mediators, Context of data use	This code is applied to quotes that refer to the role that the media plays in mediating the use of data from the EQAO results reports to the public.
Parents	Mediators, Context of data use	This code is applied to quotes pertaining to parents, the actions of parents and the roles that they play in the educational community, for example, parents are provided with the individual student results reports and can decide whether they want their children to see their results on the EQAO assessment.
Leadership	Context of data use & production, Social context	This code is applied to quotes where educators, through their actions, demonstrate knowledge about and commitment to using data which contributes to building a strong vision for data use in their schools.

Principals	Mediators, Context of data use, Social context	This code is applied to quotes that refer to principals, and their roles within the EQAO assessment program, for example, some principals mediated the use of data from the school results reports, usually within a social context during staff meetings.
Cultivating the Desire to Transform Data into Knowledge	Context of data use, Social context	This code is applied to quotes that refer to the process where together, educators work to promote the desire to understand and learn how to use data more effectively (through staff meetings, PLC‟s or PD on data use), through instilling a sense of trust and belief that data can positively contribute to learning (Mason, 2002).
Popular Prejudices	Context of data use, Social context	This code is applied to quotes that exemplify educators‟ preconceptions or prejudices about the use of data for decision making, which may increase based on a lack of exposure or familiarity with the activities inherent in the production or use of data. For example, impartiality may also be exhibited among those teachers who do not directly take part in the process of data production or data use within the EQAO assessment program.
Preoccupations	Context of data use	This code is applied to quotes that exemplify teachers‟ preoccupations, such as those regarding the receipt of raw data as well as with their level of comfort and capability regarding the use of data for decision making, which acts as a barrier to the productive use of data.
Organizing Data Management	N/A	This code is applied to quotes that reflect educators‟ actions involving the organization of resources and personnel, the cleaning of data, securing data, updating data, importing data into analytical software, and formatting data for reporting (Mason, 2002).There were no examples of organizing data management in the comments of teachers.
Up-Front Planning	N/A	This code is applied to quotes that refer to the actions of educators, which demonstrate the identification of data needed, the integration of multiple data sources and the maintenance of data collection processes (Keeney, 1998; Lachat, 2001). There were no examples of up-front planning in the comments made by the teachers.

Appendix C

Lakehead Public Schools

Jim McCuaig Education Centre
2135 Sills Street Thunder Bay ON P7E 5T2
Telephone (807) 625-5100 Fax (807) 623-5833

Education Officer: Paul Tsekouras

November 20, 2009

Melissa Hill
Graduate Student
Lakehead University
Faculty of Education
955 Oliver Rd
Thunder Bay, ON
P7B 5E1

Dear Melissa Hill:

On behalf of Lakehead Public Schools, I am pleased to grant you permission to carry out your research entitled, *Knowledge Mobilization: Elementary Teachers' Perceptions of EQAO Provincial Assessment.*

The Lakehead District School Board looks forward to cooperating with you and to receiving your final report. Please contact the Principal(s) directly at the school(s) planned for your research to receive their permission for their particular participation.

I will return the signed application package to you by mail.

Sincerely,

Paul Tsekouras
Education Officer

Appendix D

Interview Protocol for The Education Data Issues Model: Using a knowledge mobilization framework to examine teachers‟ engagement with large scale assessment data as a means to enhance student learning, by Melissa Dawn Hill

Date and time:	
Interviewee Pseudonym:	
School code:	
Current Grade level & Number of years experience Teaching	

My name is Melissa Hill. I am working on a study regarding elementary teachers‟ perceptions of the EQAO assessment program. The purpose of the study is to obtain your feedback on the topics included in the questions. For the study, I am interviewing five teachers from grade 3 and five teachers from grade 6. Thanks for volunteering to participate.

The pilot test is in two parts. First I will interview you using the draft interview questions. Next I will ask you for feedback on the questions. If you have any other feedback at that time (e.g., interview style) then please don‟t hesitate to share your ideas. The goal is to improve the clarity and content of the interview questions for a future research study of elementary teachers in

Ontario. I am also interested in other questions that you think we should ask teachers during the later interview sessions.

In order to maintain confidentiality and your anonymity, please chose a pseudonym which is how you‟ll be referred to for the duration of the pilot study. Excerpts from this interview may be made part of the final research report, but under no circumstances will your name or identifying characteristics be included in this report.

I would like to audio-record this interview so I can transcribe and analyse the data, may I record this interview?

(Yes) If there is anything that you don‟t want to be recorded we can use a timeout signal and I will turn the tape recorder off. You will have an opportunity to review the transcripts of the audio recorded interview.

(No) Then I would like to take notes during the interview. You are welcome to review the notes later.

Do you have any questions at this time?

(If they said YES to the recording question)…Is it all right for me to turn on the recorder now?

(If they said NO to the recording question)…Let‟s get started.

Preliminary Question:

1) Have you received any special training regarding the EQAO and/or participated in the marking of the EQAO assessments during summer months? If yes – over how many years?

Part 1 General Questions

2) What do you consider the primary purposes of the EQAO assessments?

Part 2 Questions about Impact of EQAO on Teachers

3) How do the EQAO assessments impact your knowledge of the curriculum? ("Impact" - making a difference to subsequent actions that people take or refrain from taking)

4) How do the EQAO assessments impact your teaching practice, in terms of organization, planning, and teaching strategies?

5) In your opinion, how do the EQAO assessments impact your students during the preparation, writing and receipt of test results?

6) How do you view your own ability, including confidence and skill, to use the data in the results from the EQAO assessments?

7) What are some barriers that make the EQAO assessments difficult to use?

8) What are some facilitators that make the EQAO assessments easy to use?

9) Do you interpret the data in the results of the EQAO assessments among other educators in a social context, during staff/division meetings or PLC"s? (If yes – does the social context in which you discuss the results act as a facilitator for the interpretation and use of test results?)

10) Do any mediators such as the media, think tanks, policy people, lobbyists, have influence on how to interpret the data?

Part 3 Questions about Timing

11) What do you think about the scheduling of the EQAO assessments?

12) What do you think about the timeliness of the publication of results?

13) Does the scheduling and/or timing of the assessments and the timeliness of the EQAO publication, impact their usefulness and how?

Part 4 Questions about Dissemination

14) Do you get enough information back in the Student, School and School-Board Reports, to effectively improve your practice?

15) In your opinion is there a better way to communicate the data in the results? (Prompt: for example a change in the organization of data or the accessibility to those data…)

Part 5 Final question

16) How would you change the EQAO assessments to better suit your needs? (Prompt: for example, changes to the test design, the training of more teachers, administration of the test, scheduling of the test, reporting of results and/or the provision of support/resources)?

Appendix E

Researchers‟ Agreement Form for the Lakehead University Review Board

1) Summary of Purpose of Research

The purpose of this research is to pilot test interview questions exploring grade 3 and 6 elementary teachers‟ perceptions of EQAO Provincial Assessments. This research is part of a larger research project sponsored by the Elementary Teachers Federation of Ontario and conducted by a team of Ontario researchers lead by Dr. Don Klinger of Queens University.

2) Research Methodology

A) A sample of 3 grade 3 teachers and 3 grade 6 teachers will be used in the plot study. There will be 6 participants in the pilot test study.

B) The method of data collection is semi-structured interviews. The participants will be provided with a paper copy of the questions (in advance of the interview). The interview will be approximately 30 minutes. The interview will be audio recorded (if participants agree) and the answers will be transcribed. If the participants do not want to be audio recorded then their answers will be written down during the interview. The interview protocol is attached as Appendix B. The method of data analysis will be interpretational analysis, which involves a systematic set of procedures to code and classify qualitative data to ensure that the important constructs, themes, and patterns emerge. The data collected will be coded using the inductive process outlined by Seliger and Shohamy (1989) which locates categories and patterns across the data and can be used to further refine and organize the data. Interpretational analysis will be completed as per Gall, J.P., Gall, M.D., & Borg, W.R., (2005), which consists of the following: “(1) prepare a database containing all the data (documents, recordings, transcripts) collect during the…; (2) divide the text into meaningful segments (e.g., each question plus the participant‟s

response might be a separate segment); (3) develop meaningful categories to code the data; (4) code each segment by any and all categories that applied to it; (5) cumulate all the segments that have been coded by a given category; and (6) generate themes that emerge from the categories" (p.315).

3) Recruitment Procedures

Following research ethics approval from Lakehead University and ethics approval at Lakehead Public Schools, a list of potential participants will be suggested by the school board. Potential participants will be selected for invitation to participate in the study, based on teaching experience. There will be 6 participants in the pilot test study. For the grade 3 teachers: one teacher will have under 5 years of experience as a teacher, one will have between 5 and 15 years experience as a teacher, and one will have over 15 years. The same experience categories will be used for selection for the three grade 6 teachers. Potential participants will be invited to participate in the study with a cover letter and informed consent form. A date and interview time that is convenient for the participant will be arranged.

4) Harm and/or potential risks to participants

A) There is no foreseeable risk or harm to participants.

B) Pseudonyms will be used to preserve the confidentiality and anonymity of participants. Participants chose their own pseudonyms. There will be no identifying information linked to the data that participants provide or in the reporting of results.

5) Deception

There is no deception involved.

6) Benefits to subjects and/or society

There are no direct benefits for the individual participants. The benefits to teachers as a group are that the interview protocol will be revised based on their feedback and will be used in a research study with participants from the Elementary Teachers Federation of Ontario.

7) Informed Consent

a) Potential participants will be informed via cover letter and informed consent and will consent (if they chose) by completing the consent form. All information will be provided on the cover letter.

b) Consent form will be attached and printed on Lakehead University Letterhead.

c) No phone surveys will be included in the pilot test.

d) Individuals under the age of 18 and members of a vulnerable group will not be invited to participate in the pilot testing of interview questions.

e) The participants will be informed of their right to not answer and/or comment on any questions included via the cover letter and consent form. Also they are able to withdraw from the pilot testing at any time without penalty of any kind.

8) Anonymity and Confidentiality

Pseudonyms and school codes will be used to preserve the confidentiality and anonymity of participants. Potential participants chose their own pseudonyms. There will be no identifying information linked to the data that participants provide or on the reporting of results. The participants‟ schools will be given random codes so that the school where the teacher works will be anonymous.

9) Storage of data

The data generated from the pilot study will be stored for 5 years in the Data Convergence Lab at Lakehead University.

10) Peer review

The pilot testing is a part of a study for my Master‟s Thesis, which will be reviewed by a thesis committee.

11) Research partners and graduate students

The pilot research will not involve graduate students or researchers at another university. No other graduate student research assistants will be participating in the pilot study.

12) Conflict of Interest

At this time, there are no foreseeable conflicts of interest. If a conflict of interest does arise, then the researcher will disclose any actual, perceived or potential conflicts to the Research Ethics Board.

13) Dissemination of research results

The participants will be made aware of the research findings from the pilot test, as they will be sent a brief report of results. The findings of the pilot study will be reported and actions will be proposed to revise the interview questions for a future study of Ontario Elementary Teachers.

Appendix F

Pilot Study for Knowledge Mobilization: Elementary Teacher's perceptions of EQAO Provincial Assessment

An invitation to participate

A graduate student at Lakehead University, Melissa Hill, is conducting a pilot study of interview questions for a study entitled "Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment". The purpose of this research is to **pilot test interview questions** exploring Grade 3 and 6 elementary teachers' perceptions of EQAO Provincial Assessments.

You are invited to participate in a study to pilot test the interview questions for this research. You are a critical source of information for this pilot study. You have a unique perspective on EQAO Provincial Assessment. You are important and we want to incorporate your perspectives and experiences into the pilot study.

If you volunteer to participate in the pilot study, you will (a) be interviewed for about 30 minutes using the pilot test questions and (b) provide feedback regarding the content and clarity of the questions (about 10 minutes). You may volunteer to have the interview audio recorded and/or Melissa will make written notes. The notes will be shared with you for confirmation and validation.

Your participation is voluntary, you may refuse to participate in any part of the study, and you may withdraw from the study at any time. Further, you may decline to answer any questions during the study. There are no foreseeable risks, harms or inconveniences. There are no direct benefits, other than the benefits to teachers as a group, as the interview protocol will be revised based on your feedback and will be used in a research study of Grade 3 and 6 teachers in Ontario.

Your comments in the interview and your feedback will be summarized in a brief report. No individual or school will be identified in any report of the results. Only Melissa Hill and her supervisor, Dr. Christina van Barneveld, will have access to the data. A pseudonym for your name and a random school code will be used on all data collection instruments and reports to ensure anonymity.

All comments are confidential and will only be disseminated to stakeholders in AGGREGATE form.

Melissa Hill, the graduate student conducting the pilot study will use the anonymous data as part of future research, thesis research, presentations and/or future publications. Pseudonyms and school codes will be used on all reports to ensure anonymity. Data from this study will be securely stored for five years in the Data Convergence Lab at Lakehead University.

If you would like to participate in the preliminary study, outlined above, please email Melissa Hill at mdhill@lakeheadu.ca.

If you have any questions or concerns about this study or would like to obtain a copy of the report, please do not hesitate to contact Melissa Hill via email at mdhill@lakeheadu.ca . You may also contact the Lakehead University Research Ethics Board at 807-343-8283.

Appendix G

Pilot Study for Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment

Consent Form for Pilot Study Participants

My signature on this sheet indicates that I agree to participate in a pilot study by Melissa Hill, a graduate student of Lakehead University. The title of the pilot study is "Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment". My signature on this sheet also indicates that I understand the following:

- I have read and understood the cover letter for the study.
- I agree to participate.
- I understand the potential risks and/or benefits of the study, and what those are.
- I understand that I am a volunteer and can withdraw from the study at any time.
- The data I provide will be securely stored at Lakehead University for five years.
- I understand I can request a copy of the research findings from Melissa Hill at mdhill@lakeheadu.ca.
- I will remain anonymous in any publication or public presentation for research findings.
- All comments are confidential and will only be presented in aggregate form.

Participant's Name (please print)_____

School _____

Grades Taught (3 or 6) _____

Signature _____

Date _____

Thank you for participating in this study

Appendix H

Lakehead
UNIVERSITY

Office of Research

Tel (807) 343-8283
Fax (807) 346-7749

October 28, 2009

Principal Investigator: Dr. Christina van Barneveld
Student Investigator: Melissa D. Hill
Faculty of Education
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1

Dear Dr. van Barneveld and Ms Hill:

Re: REB Project #: 011 09-10
Granting Agency name: Elementary Teachers Federation of Ontario
Granting Agency Project #: N/A

On behalf of the Research Ethics Board, I am pleased to grant ethical approval to your research project entitled, "Pilot Study for Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment", under funded project title, "The Impacts of Uses of the EQAO Provincial Testing Program: Exploring the views and the perceptions of elementary teachers".

Ethics approval is valid until **October 28, 2010**. Please submit a Request for Renewal form to the Office of Research by September 28, 2010 if your research involving human subjects will continue for longer than one year. A Final Report must be submitted promptly upon completion of the project. Research Ethics Board forms are available at:

http://research.lakeheadu.ca/ethics_resources.html

During the course of the study, any modifications to the protocol or forms must not be initiated without prior written approval from the REB. You must promptly notify the REB of any adverse events that may occur.

Completed reports and correspondence may be directed to:

Research Ethics Board
c/o Office of Research
Lakehead University
955 Oliver Road
Thunder Bay, ON P7B 5E1
Fax: (807) 346-7749

Best wishes for a successful research project.

Sincerely,

Dr. Richard Maundrell
Chair, Research Ethics Board

/scw

cc: Office of Research
Office of Financial Services

Appendix I

Lakehead University Research Ethics Board

Re: Pilot Study for Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment: Request for amendment to the research ethics application approved on Oct. 28, 2009, REB #011 09-10.

January 13, 2010

Dear Lakehead University Research Ethics Board,

This letter is to request approval for an amendment to research entitled "Pilot Study for Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment" conducted by Melissa Hill and Dr. Christina van Barneveld from Lakehead University Faculty of Education.

The amendments consist of changes to the name of the study, edits to the wording of most questions used in the interview protocol, the addition of a new question and the removal of the term pilot study from the interview protocol.

Requested Amendment #1: Change to the name of the study.

> The title of the project was "Pilot Study for Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment"
>
> A change in the wording of the title, to: "Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment"

Requested Amendment #2: Edits to the wording of most questions.

> The amendments I wish to make is:
>
> Question #3:
> 3) How do EQAO assessments impact your teaching practice?
> Is now question #4:
> 4) How do EQAO assessments impact your teaching practice, in terms of organization, planning, and teaching strategies?

Question #4:
4) In your opinion, how do EQAO assessments impact your students?
Is now question #5:
5) In your opinion, how do EQAO assessments impact your students during the preparation, writing and receipt of test results?

Question #5:
5) How do you view your own ability to use the results from EQAO assessments?
Is now question #6:
6) How do you view your own ability, including confidence and skill, to use the data in the results from EQAO assessments?

Question #6:
6) What are some barriers/facilitators that make the EQAO assessments difficult/easy to use?
Is now questions #7 and #8:
7) What are some barriers that make EQAO assessments difficult to use?
8) What are some facilitators that make EQAO assessments easy to use?

Question #7:
7) Do you interpret the results of the EQAO assessments in a social context, with other educators? Prompt: does the social context (in which results are interpreted) act as a facilitator for the interpretation and use of test results? why or why not?
Is now question #9:
9) Do you interpret the data in the results of the EQAO assessments among other educators in a social context, during staff/division meetings or PLC's? (If yes – does the social context in which you discuss the results act as a facilitator for the interpretation and use of test results?)

Question #8:
8) What do you think about the timing of the EQAO assessments and the timeliness of the publication of results?
Is now questions #11 and #12:
11) What do you think about the scheduling of the EQAO assessments?
12) What do you think about the timeliness of the publication of results?

Question #9:
9) Does the timing of the EQAO assessments and the timeliness of the EQAO publication, impact their usefulness?
Is now question #13:
13) Does the scheduling and/or timing of the EQAO assessments and the timeliness of the EQAO publication, impact their usefulness and how?

Question #10:

10) Do you get enough information back from EQAO (in the results report) to effectively improve your practice? (If no – then what sort of information would be more helpful?)
Is now question #14:
14) Do you get enough information back from EQAO in the Individual Student Reports, School Reports and the School-Board Reports, to effectively improve your practice? (If no – then what sort of information would be more helpful?)

Question #11:
11) In your opinion is there a better way to communicate the results?
Is now question #15:
15) In your opinion is there a better way to communicate the data in the results? (Prompt: for example a change in the organization of data or the accessibility to those data…)

Question #12:
12) How would you change EQAO assessments to better suit your needs?
Is now question #16:
16) How would you change EQAO assessments to better suit your needs? (Prompt: for example, changes to the test design, the training of more teachers, administration of the test, scheduling of the test, reporting of results and/or the provision of support/resources)?

Amendment #3: Addition of a new question.

I would also like to include a new question: now #10, in the Interview Protocol, as follows:
Question #10:
10) Do any mediators such as the media, think tanks, policy people, lobbyists, have influence on how to interpret the data?

Amendment #4: References to the pilot study are removed from the interview protocol, please see attached.

Thanks for considering these changes. Please do not hesitate to contact me for any reason.

Sincerely,

Melissa D. Hill, Graduate Student at Lakehead University

Appendix J

Lakehead
UNIVERSITY

Office of Research

(807) 343-8283
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MEMORANDUM

Date: January 22, 2010

To: Dr. C. van Barneveld/ Ms Melissa Hill

From: Dr. Richard Maundrell

Subject: Amendment for REB Project #011 09-10

Thank you for your request for amendments for your project entitled, "Pilot Study for Knowledge Mobilization: Elementary Teachers' perceptions of EQAO Provincial Assessment".

The amended wording to remove reference to the term "Pilot Study" in both the title and the invitation/consent letter is acceptable to the Research Ethics Board.

Please continue to advise us of any future changes to this project.

Sincerely,

Dr. Richard Maundrell
Chair, Research Ethics Board

/scw

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