

**HOW BRITISH COLUMBIA  
SCHOOL SUPERINTENDENTS MANAGE DATA**

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## ABSTRACT

The British Columbia Ministry of Education has been collecting demographic and academic performance information on every student in grades Kindergarten-12 since 1992. The amount of data held by the Ministry and now available for use is considerable: between 50 and 500 data elements have been collected from each of more than 500,000 students annually for the last 15 years. In most school districts additional data, not provided to the Ministry, is collected on the performance of their students.

School District Superintendents, as senior educational leaders in each school district, play vital roles in connecting data use to student learning and achievement. However, the patterns and strategies they employ to manage data use are largely unknown: consequently, the central research question of this dissertation is how British Columbia Superintendents manage data use in their districts.

The study uses a grounded theory method to pursue this question. Twenty-two British Columbia Superintendents participated in interviews that each lasted between one and two hours. The resulting transcripts were analysed intensively to determine the underlying patterns and core variables at play. Eventually the following theory emerged: School District Superintendents improve their districts' capacity to create and use data-based knowledge by combining staff engagement with structural support in such a way that the school district advances along a trajectory of increased data use in a series of five developmental phases.

The theory offers a model that enables assessment of how far a Superintendent has taken a district and what possibilities there may be for further development of data-based knowledge. The model also provides Superintendents with an understanding of the

actions that are critical for continuous improvement in the capacity of the district to use data effectively.

The study suggests that the British Columbia Ministry of Education should provide overall leadership to develop organizational intelligence in the education system by modelling data-based knowledge use, building trust, working with Superintendents to supply the necessary technology and data, and supporting processes that turn data into knowledge.

*To Mom and Dad*

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## FOREWORD

In 1973 I was a high school dropout nearing the end of a two-year sojourn to South America. In southern Chile I met a man--a peasant--who had over the last three years learned to read. He was taking his regular walk to a courthouse in a town 20 kilometres away. There he would argue, futilely, that the small community of farmers he represented should be allowed to keep enough land to support them. The land, owned largely by absentee landowners, had been redistributed to the peasants who worked it by the government of Salvador Allende. Each family now had enough land to sustain it, and the necessary educational support to allow family members to become literate. The Allende government lasted three years: on September 11, 1973 it was overthrown by the military, headed by General Augusto Pinochet, who reduced the landholding of each family to below what was needed for sustainability. The man I met had become sufficiently literate to argue a case in court. He knew he could not win, but nevertheless he fought for the land and for a place in a world made possible by education. In that moment I saw the meaning of education; how it changes the world for individuals and communities.

I have been fortunate: I was able to return to school and begin a path of lifelong education. Better yet, I have had the privilege of spending most of my working life in the Ministry of Education. I joined the Ministry in the exciting wake of the 1989 Sullivan Royal Commission on Education, which firmly established that the purpose of the education system in BC was to meet the needs of the learner. Although many of the specific policies put in place in response to the Sullivan Commission eventually fell afoul of public opinion and were abolished by governments in the 1990's, the focus on the

learner remained. This led to the development of a data system that captured information on individual students over their full Kindergarten -12 education.

My work in the Ministry consists in part of directing a department that organizes, analyses, and reports on this data in ways that help support student performance in the Kindergarten-12 system. Our goal is to ensure that Ministry personnel, teachers, school based administrators, Superintendents, and parents can use the data to improve student achievement.

It has been my good fortune to have integrated the deep value I place on education with the mission of the organization I work for, and with the work itself. Consequently, when I was faced with choosing a topic for my doctoral thesis, I had only one question to ask: what topic would best support my work?

The Ministry has a huge data set resulting from 17 years of collecting demographic and achievement data from about 600,000 students per year. This has led in the past to a belief (at least inside the Ministry) that the most important data users are the staff of the Ministry. But over time, the obvious has become clear. The Ministry of Education educates no students. While some policy decisions can be informed by provincial level data, the vast resources of data must be put in the service of school districts, schools and classes. It is the districts that ultimately decide how to incorporate data into instructional improvement. The leaders of the districts are the BC School District Superintendents: they interpret and implement the policy of the Boards of Education and the Ministry; they set norms and expectation; and they have significant influence in the allocation of resources. My emerging understanding of the importance of the Superintendents in using and managing data to improve student achievement

accompanied an emerging realisation that the Ministry actually knew very little about how Superintendents used or managed data. Without this knowledge, how could the Ministry effectively support the Superintendents? My topic area was born. I would study how Superintendents manage data.



## CHAPTER 1: OVERVIEW

### **The British Columbia Education System<sup>1</sup>**

In Canada education is a provincial responsibility. The British Columbia (BC) education system serves about 650,000 students with 40,000 teachers and administrators. The system includes 1,600 public schools and 300 independent schools. About 10 per cent of the students in BC attend independent schools, which are partially funded by the government. The cost of running the system is \$6 billion annually. The public school system is divided into 60 school districts which are extremely varied in geography, population, and cultural make up. Nearly three quarters of the districts are in rural geographic areas. The largest district, Stikine, at 158,755 square kilometres, is a little larger than Greece. In 2008/2009 this district served 264 students. Some urban districts enrol more than 50,000 students. The smallest district is only a few square kilometres and serves 7,500 students. Provincially, enrolment has declined steadily over the last decade and is expected to continue to decline for at least five more years. Currently a little more than 10 per cent of the students in the public school system are Aboriginal. However, Aboriginal student numbers have been increasing even as the general student population declines. A large number of students enter the school system unable to speak English and are enrolled in English as a second language (ESL) programs; in 2008/09 about 10 per cent of the student population were in ESL programs.

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<sup>1</sup> Nearly all the numbers in this section are from the Ministry of Education's *Summary of Key Information*, 2008/2009 (Ministry of Education, 2009c).

## **A Richness of Data**

The BC Ministry of Education (Ministry) has been collecting demographic and student achievement<sup>2</sup> information on every student in grades Kindergarten-12 since 1992. The information is connected to a unique Personal Education Number (PEN), so it is possible to follow students' progress over time, even if they change schools or school districts. Recently, the PEN tracking system has been extended to British Columbia (BC) public post secondary institutions. Initially the PEN system supplied the Ministry with enrolment information needed to fund school districts. Over time, student outcome information was added (e.g. grade to grade transition, provincial examinations results, graduation) as more activities were measured and included in the data set. The amount of data held by the Ministry and now available for use is considerable: between 50 and 500 data elements have been collected from each of more than 500,000 students annually for the last 17 years. This data set is only part of the total amount of data that is collected and potentially available to be used by groups within the education system. In most school districts achievement data from district-wide assessments is collected, and in some districts fine grained data about the progress of individual students as they transition through the system is collected. The data collected in these districts is much more detailed than that held by the Ministry and often focuses on students who have left the system prior to graduating, or who are in danger of doing so. In addition many schools have their own data sets of student achievement.

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<sup>2</sup> The former BC Deputy Minister of Education, Emery Dossdall (2002), defined achievement as "all achievements for all students." In practise this has been interpreted to mean: 1) more students completing more years of schooling, 2) higher school completion/graduation rates, 3) more students doing better on provincial tests and examinations, 4) increased student and parent satisfaction, 5) increased rates of student transition to postsecondary education, and 6) reducing the gaps between the achievements of different groups of students (e.g., between Aboriginal and non-Aboriginal students, boys and girls).

## **Vignette: Aboriginal Education—A Motivating Data Story**

*My interest in the use of data to improve student achievement was sparked by observing how the analysis and use of data about the performance of Aboriginal students began a transformation of Aboriginal education. This transformation has seen the challenge of improving Aboriginal education emerge from relative obscurity to become a priority of the BC education system, significant improvements in graduation rates of Aboriginal students, and structural changes to the school system to ensure that Aboriginal communities play an important role in decisions about how their children will be educated.*

*Aboriginal students constitute about 10 per cent of BC's public school student population. In the mid 1990s the Ministry director responsible for Aboriginal education noticed that despite the existence of data clearly demonstrating the failure of the BC school system to educate Aboriginal students (at that time about 31 out of every 100 Aboriginal students in Grade 8 would graduate from high school), the data seemed to exist in a vacuum; it elicited no action. The director realized that data alone was insufficient to prod the system into response. His staff worked with the data to make it tell a story; they developed charts, powerful graphics, and reports that were easily understood. He presented the story to a provincial gathering of school Superintendents, pointedly suggesting that this situation was their responsibility to recognize and fix.*

*I was at that meeting. The message was not well received. Many in the audience were angry and protested that a Ministry bureaucrat could not understand the problems Aboriginal students posed for schools. Much discussion centred on the difficulty of educating Aboriginal students. It was as though the problem lay with the students themselves rather than the system's inability to meet their educational needs.*

*Had the director simply dropped his data bombshell into the meeting and left it at that, the anger and energy would likely have dissipated leaving the education system to operate virtually oblivious to its greatest failure. But the gathering of Superintendents was not the main target for this director's story of Aboriginal achievement. The real audience was the Aboriginal community itself - students, parents, caretakers, Elders, and Chiefs. The data provided to Aboriginal communities was incorporated into a meaningful story of how the academic struggles of their children had been systematically ignored. The Aboriginal communities used the story to demand changes in the delivery of education to Aboriginal students. The data story also became a powerful tool to support Aboriginal leaders in raising awareness of schools, Superintendents, and the province, of the pressing need to improve achievement of Aboriginal students.*

*The data, used in this context, made Aboriginal students visible - in Taylor's (2004) phrase, Aboriginal students became part of a "social imaginary" of school, district, and Ministry staff. Over the next several years the Ministry instituted accountability processes which forced schools to take Aboriginal performance into consideration when making school plans. The Ministry also required school and district administrators to begin discussions with Aboriginal communities about their education needs. The discussions became formalized through the development of Aboriginal education Enhancement Agreements (EAs) which are a written commitment by school district administration to work towards meeting specified goals that have been developed in conjunction with representatives of local Aboriginal communities (Aboriginal Education Branch of the BC Ministry of Education, 2003). Aboriginal student achievement began to improve.....*

## **The Current Situation**

In the years since the above data story was first told to the meeting of school district Superintendents there have been remarkable improvements in the outcomes of Aboriginal students. Provincially the graduation rate (as determined by the percentage of Grade 8 students who have graduated within six years) completion rate has risen from 31% to 50% (Ministry of Education, Skills and Training, 1996; Ministry of Education, 2006a). In some schools the performance of Aboriginal students equals or exceeds non-Aboriginal students. Even those Aboriginal students who leave school without graduating are staying in school longer (Ministry of Education, 2006b). Nearly all districts now have EAs, and no discussion of education performance would be considered complete without considerable attention being focused on how Aboriginal students are faring. There remains a long way to go before the education system can be said to have addressed the challenge of providing adequate education for the majority of Aboriginal students, but the issue has now been irrevocably ensconced in public discourse. The data relating to Aboriginal students, which was originally used to shock the system into paying attention, is becoming a tool of continuous improvement; it forms the basis of the discourse between Aboriginal communities and the schools their children attend, a salient reminder of how much has been accomplished and how much is yet to be done.

The use of data to focus attention on issues of student performance, demonstrated so vividly in relation to Aboriginal students, was soon applied to other students in the Kindergarten-12 system. In the mid to late 90s, Ministry policy emphasized the use of data for accountability purposes (Ministry of Education, 2000). More recently the

Ministry has begun to shift its emphasis from data focused on accountability<sup>3</sup> to data focused on improving student achievement. In the fall of 2006 the need for explicit strategies to support data *use* at all levels was recognized by Deputy Minister Dosdall when he changed the name of the Information Department to the Knowledge Management Division. A sustained effort has been made to help teachers and principals use data<sup>4</sup> to inform decisions at the classroom and school level. Workshops have been held, conferences convened, trainer of trainers programs initiated, and external experts called on to help build the capacity of school staff to use and interpret data. Very little attention, however, has been paid to how senior leaders in the school districts, the Superintendents, manage or use data. Because we do not know this, we cannot help Superintendents make best use of the rich sources of data available to them.

### **Research Problem**

Data can be a powerful tool for improving student achievement (Cousins, 2006; Earl and Katz, 2006; Hoyle, 2004; Williams, 2002; Fullan and Stiegelbauer, 1991) but their effectiveness will depend on how well they are used - particularly by Superintendents. School Superintendents, as the senior educational leaders in each school district, play vital roles in connecting data use to improving student achievement. They

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<sup>3</sup> Although the Ministry of Education does not explicitly define accountability, the contexts in which the word is used suggest that the emphasis is on public accounting of how well students do. After a Ministry reorganization, the accountability contracts were renamed achievement contracts and the emphasis shifted to being a "Public statement of commitment by a Board of Education to improve success for each student in the district" (Ministry of Education, 2009b).

<sup>4</sup> The distinctions between data, evidence, information and knowledge are problematic. Part of what I hoped to discover through the research is what Superintendents understand by the word "data". The Ministry does not explicitly state what it means by data, but a review of Ministry publications, and the discussions of the Deputy (both documented and undocumented) point to a conception of data as organized, quantitative and somewhat standardized information that operate as indicators of student achievement. Data would be contrasted to anecdotes or feelings about student achievement.

sit between the policymakers - the Ministry and School Boards, and the staff implementing instruction - and teachers and principals. In carrying out their responsibilities, Superintendents are instrumental in interpreting policy and in setting up systems that support its implementation (School Act, 1996). The Superintendents' capacity and willingness to use data have far-reaching implications: how much resource the district will apply to data use, whether district-level decisions will take data into account, the way in which data are perceived within the district, "stories" about data, and the degree to which the Ministry will be able to support the Superintendents' use of data.

The Ministry-held database of student information provides Ministry staff with a wide range of choices in how to report, analyze, and apply the data, but for the most part, the data have been reported with little consideration or discussion about how Superintendents actually use or manage the use of data. If the Ministry is to: a) support Superintendents in their capacity to use data, and b) support the school system generally through providing data in more useful forms, Ministry staff need to understand how Superintendents currently manage data use; consequently, the core research problem this dissertation will address is how BC school district Superintendents manage data use in their districts. If we can discover patterns and connections in how Superintendents manage data use, Ministry staff may be able to more effectively support such use.

### **Research Question**

There are many ways in which Superintendents' use of data could potentially be improved. For example, the Ministry can assist by providing data that are more relevant and in formats that are more accessible to the needs of Superintendents, principals, and teachers (Mandinach, 2006). Superintendents also have access to a good deal of data

within their districts that might be better used; they may wish to design their own forms of access and reporting; they may wish to collect different kinds of data. Whatever the changes are that will help improve the use of data, a deep understanding of the current patterns of data use within the district is essential to planning and implementing improvements. My central research question, “How do BC School District Superintendents Manage Data Use in their Districts?” is intended to be broad enough to ensure that the answers will emerge from the experiences of the Superintendents themselves, not from preconceived theoretical positions or definitions. This research question is framed by a super ordinate question: what do Superintendents consider their role to be? Sub questions I expected to be answered during the data-gathering included:

- What Superintendents think data are;
- What Superintendents perceive achievement or outcome information to be;
- What data Superintendents have access to;
- What Superintendents would like to have access to;
- What forms Superintendents want the data in;
- What Superintendents perceive their role is *vis a vis* data use;
- What role data plays in the district.

### **Significance of the Problem**

That schooling<sup>5</sup> is of great value both to individuals and society in general is so often demonstrated that it hardly requires elucidation. To Michael Fullan the fundamental purpose of education is moral: "At the micro level, moral purpose in education means making a difference in the life chances of all students - more of a difference for the

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<sup>5</sup> One could also consider, at a somewhat deeper level, the value of education. A good deal has been written on the difference between schooling and education, but for my purpose, which is to establish the significance of the problem of data use, it is enough to show that 1) data use can effect schooling, and 2) schooling has been (and will likely continue to be) important to individuals and to society in general.



disadvantaged because they have further to go. At the macro level, moral purpose is education's contribution to societal development and democracy" (Fullan, 1999, p.1). In 2006 the BC Progress Board wrote "... for all British Columbians, education clearly matters: it is the bedrock of contemporary society" (p.1). The data supporting the value of schooling to individuals is persuasive. The BC Progress Board (2006) reported recent research indicating that individuals improve their lifetime earnings by 10-14% for each year they remain in high school. High levels of literacy, a key outcome of education, have been associated with increased civic participation, increased opportunities for lifelong learning and personal literacy, as well as greater economic success. (Kirsh, 1993; Murray, 1997; Tuijnman, 2001 in Statistics Canada, 2003). The Council of Ministers of Education Canada (CMEC) released a joint declaration in 2008 recognizing a "direct link between a well-educated population and (1) a vibrant knowledge-based economy in the 21st Century, (2) a socially progressive, sustainable society, and (3) enhanced personal growth opportunities for all Canadians" (CMEC, 2008). The Organization for Economic Cooperation and Development (OECD, 2006) claims a number of economic benefits of education including a positive correlation between growth in the average number of years of education of the population and growth in Gross Domestic Product, and increases in productivity in countries with higher than average levels of literacy. A literacy score of just one percent above the international average correlates to average productivity gains of 2.5%. The OECD also links higher levels of education with improvements in health.

### **Performance of British Columbia Students**

How are BC students doing? On one hand, quite well; BC is consistently among the top scoring jurisdictions in international tests of numeracy and literacy. In the most

recent international mathematics assessment undertaken by the OECD's Programme for International Student Assessment only Hong Kong, Finland, and Alberta ranked statistically higher than BC (Statistics Canada, 2005). For at least four decades the graduation rate of BC students has been increasing: rising from 52% in 1965/66 to 80% in 2007/08 (Ministry of Education, Skills and Training, 1996; Ministry of Education, 2006d). Although these measures do not describe the full spectrum of education achievement, they are crucial indicators of a relatively well functioning school system.

Despite these measures of success, formidable challenges remain. Although students function well on average, many members of specific groups of students (Aboriginal students, boys, some students for whom English is a second language, and special needs students) struggle to succeed, or even stay in school long enough to graduate.

A key measure of student success in BC, the graduation rate (defined as the percent of students in Grade 8 who graduate within 6 years), has been sitting at approximately 79% to 80% for the last five years. Although this is the highest graduation rate for BC students in the last 30 years, it still leaves more than 20% of students who have gone through the BC school system with an incomplete education. Furthermore, if we disaggregate the graduation rates we see large disparities in the performance of different groups of students. Aboriginal students continue to struggle with a public school graduation rate of 50% (Ministry of Education, 2009a). Within this group of students a further significant breakout can be done - in 07/08 Aboriginal boys had only a 43% completion rate compared to Aboriginal girls at 52% (Ministry of Education, 2009a). The discrepancy between boys and girls is also evident for non-Aboriginal students, but it is

clear that most Aboriginal boys face daunting and often insurmountable challenges in BC's Kindergarten-12 school system.

Even as the BC education system struggles to meet the needs of all its students the expectations of the education system are broadening: schools in BC have always had a major responsibility for the intellectual development of students, and at least since 1989 (Ministry of Education, 1990) have been mandated to share responsibility with parents and the community for the social and personal growth of students, and are now committed to improving students' diet and levels of physical activity (Ministry of Education, 2005a). In 2005 the Ministry was given responsibility for early learning (pre-kindergarten), literacy and public libraries (Ministry of Education, 2005b).

### **Improving Student Achievement**

I have described an education system that has done relatively well in educating most of its students, but which needs to explore different strategies if it is to succeed with all of its students during a time of broadening expectations. One strategy revolves around making use of data, or evidence. Glickman (2001) argues that data collection and dissemination is becoming an increasingly important part of Canada's education systems. According to Earl (2001), use of data in making educational decisions is now generally expected. Smoker (2004) went so far as to call for teachers to become "active members of research teams - as scientists who continuously develop their intellectual and investigative effectiveness" (p.429). The Ministry's guidelines for the formal agreements it makes with districts regarding student achievement - District Accountability Contracts - reflect the importance of data in improving student achievement. "Effective school districts have a clear focus on improving student achievement. Decisions are based on a

range of data and information and are supported by effective planning and resource allocation" (Ministry of Education, 2006c, p.3).

Glickman (2001) notes that while large data sets are being amassed in educational jurisdictions throughout Canada, the capacity to make this data available in usable forms to educational leaders and practitioners needs to be increased if data are to be used as a regular component of performance management. He suggests that in order to make the data available in usable forms, we need to better understand how education leaders are or are not using data.

### **BC School District Superintendents**

The educational leaders I will be studying are the school district Superintendents. Superintendents play a pivotal role in the operations of school districts. They supervise and direct education staff, and are responsible for the "general organization, administration, supervision and evaluation of education programs and ...the operation of schools" in their district (School Act, 1996). Mintzberg notes that leaders are watched carefully by staff for clues about what kind of actions might be approved of and what might be ill advised (1990, p.232). Given the scope and authority in the role of Superintendents, it is reasonable to assume that the ways in which they wish to manage data use will have significant direct impacts on data use in the district and will consequently contribute to the capacity of the district to improve student outcomes (Earl and Katz, 2006; Cousins, 2005; Hoyle, 2004; Williams, 2002; Fullan and Stiegelbauer, 1991).

## Research Approach

Method is best governed by the natural inclinations and interests of the researcher, the nature of the topic area, and the purposes of and audience for the research (Creswell, 2003, p.21). As I analyze these elements in relation to my project, it is clear that my method will resemble what Denzin and Lincoln (2005) call *bricolage*, a “pieced-together set of representations that is fitted to the specifics of complex situation” (p.4). The method will contain elements associated primarily with qualitative research, but will also draw on some aspects of quantitative research. The overall approach will be pragmatic, as described by Creswell (2003, p.12):

Pragmatists do not see the world as an absolute unity. In a similar way, mixed methods researchers look to many approaches to collecting and analyzing data rather than subscribing only to one way (e.g., quantitative or qualitative)... Pragmatic researchers look to the "what" and "how" to research based on its intended consequences - where they want to go with it.

My work in the Ministry is primarily focused on gathering, storing, analyzing, and reporting on quantitative data. I have observed that quantitative data always needs a *context* before it is meaningful, and is most powerful when part of a *story*. Data on the achievement of Aboriginal students had been available to school districts for several years but made little impact on the way education was delivered to Aboriginal students. But when it was provided to Aboriginal communities they incorporated it into a meaningful story of how the academic struggles of their children had been systematically ignored. The Aboriginal communities used the story to demand and get improvements in the delivery of education to Aboriginal students. Research which contextualizes data and which emerges from a natural setting is consistent with a qualitative approach (Creswell, 1998; Denzin & Lincoln, 2005; Gall, Gall, & Borg, 2003).

This project can be understood as discovering the major variables at play in relation to Superintendents' use of data and the development of theory that is able to explain and predict action. The research challenge is focused on uncovering the patterns established through the interplay of multiple variables which are unknown at the onset of the research. The method must allow for in-depth, intensive data gathering associated with qualitative methods such as interviewing and observation (Gall et al.). My area of interest - how Superintendents use data - is complex and has little extant theory to draw on<sup>6</sup>. There are many potential variables in play, with no theoretical formulation that would currently identify key variables of causation or explanation. There are relatively few cases of interest (fewer than 100) as I am focusing on current or recently retired BC Superintendents. Many variables, few cases, and little existing research are conditions which are best explored through qualitative methods (Creswell, 1998).

Incorporating the meanings assigned by the participants of the phenomenon under study as part of the study is a core function of qualitative research (Denzin & Lincoln, 2005). Superintendents' own interpretations of the meaning of data and data use are important if they are to see the research as relevant to their activities.

### **Why theory?**

The appropriate approach to research should be strongly connected to its purpose. I have discussed the research problem in terms of the practical need that the Ministry has to increase the capacity of Superintendents to use data to improve student achievement. I

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<sup>6</sup> My initial interest was how BC school Superintendents use data in decision-making. It soon struck me that the decision-making could be seen as a subset of data use, and that exploring the full range of uses, which of course include decision-making, would provide a more comprehensive understanding of the possibilities for improving data use. It also became clear that I wanted to understand data use from the Superintendent's perspective and that may or may not include a primary focus on decision-making.

indicated that such improvement was partially predicated on understanding how Superintendents use data. This understanding needs to go beyond *description* of how individual Superintendents manage data use; it needs to involve being able to generate key concepts that represent general patterns of data use and to specify the relationship between those concepts; in other words the project requires the development of theory. The theory needs to bridge understanding and prediction; it must encompass "factors that influence an outcome, the utility of an intervention, or understanding the best predictor of outcomes" (Creswell, 2003, p.21).

Deming (1994) writes that "Theory is a window into the world. Theory leads to prediction. Without prediction, experience and examples teach nothing. To copy an example of success, without understanding it with the aid of theory, may lead to disaster" (p.103). To Deming, knowledge is prediction. Information becomes knowledge when it is processed by theory into prediction. And without knowledge, Deming observes, good intentions and dedication mean less than nothing. "Best efforts and hard work, not guided by new knowledge, they only dig deeper the pit that we are in" (p.1).

The kind of theory required must fit the situation "on the ground" in BC; it must be workable in the sense it should be able to "explain what happened, predict what will happen and interpret what is happening" (Glaser, 1978, p.4); it must be relevant; and it should be flexible enough to take new circumstances into account as the BC education system continues to develop. It is of course possible that there will be no pattern and the Superintendent's management of data are essentially random. This would be an important finding for an organization dedicated to improving the capacity of Superintendents to use data to improve student achievement.

The purpose of this project is to develop substantive theory: theory that is derived from activities in a limited field or domain (Long, 1980). In this case the domain is the BC Kindergarten-12 Education system. Glaser (1978) sees substantive theory as a way of providing lay experts, or, as he calls them people "in the know" (p.13) with a method of transcending their highly localized knowledge<sup>7</sup>. "What the man in the know does not want is to be told what he already knows. What he wants is to be told how to handle what he knows with some increment in control and understanding of his area of action" (p.13). Theory is thus seen as a practical tool to help manage social processes. It is also, according to Glaser and Strauss (1967), a "strategy for handling data in research, providing modes of conceptualization for describing and explaining." (p.3). Theory should provide categories and hypotheses that are clear enough to be operationalized and verifiable in future studies. It should also be understandable to students and significant lay persons as well as academics.

"Theory that can meet these requirements must fit the situation being researched, and work when put into use. By 'fit' we mean that categories must be readily (not forcibly) applicable to and indicated by the data under study; by 'work' we mean that they must be meaningfully relevant to and be able to explain the behaviour under study" (Glaser, 1967, p.3).

Glaser and Strauss (1967) believe that the best approach to the development of theory which will satisfy these requirements is "systematic discovery of the theory from the data of social research." (p.3), that is, grounded theory based on inductive research.

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<sup>7</sup> One of the challenges of theory is to determine its appropriate scope of application. If the scope is too localized it is merely unique description, if too broad it loses connection to the empirical world.



## **Grounded Theory.**

For Glaser and Strauss a key role of grounded theory is to provide explanation and understanding in order to increase the control that people in the field have over their situations (Glaser & Strauss, 1967, p.3; Glaser, 1978, p.14). "Thus it is primarily the *user* of the theory who will be its judge. In *Discovery of Grounded Theory*, Glaser and Strauss propose four interconnected objectives for grounded theory: *fit*, *generality*, *control*, and *understanding*.

*Fit* is a product of the process of rigorously adhering to the process of deriving theory from the data, and not forcing the data into preconceived categories. Glaser (1992) writes "if a grounded theory is carefully induced from the substantial area its categories and their properties will fit the realities under study in the eyes of subjects, practitioners and researchers in the area" (p.15).

*Generality* refers to ensuring that the theory is flexible enough to be able to be applied to the shifting conditions of the substantive area under study. Again, the important perspective is the user of the theory. "The person who applies the theory will, we believe, be able to bend, adjust, or quickly reformulate a grounded theory when applying it, as he tries to keep up with and manage the situational realities that he wishes to improve" (Glaser and Strauss, 1967, p.243). Over the next 10 years Glaser (1978) developed and emphasized the need to be able to modify the theory to ensure that it continues to reflect the empirical world.

If the theory is fitted well to the data and sufficiently general to be able to work in a fluid environment, it should be able to provide the practitioner with some *control*.

The person who applies the theory must be enabled to understand and analyze ongoing situational realities, to produce and predict change in them, and to predict and control consequences both for the object of change and for other parts of the total situation that will be affected. As changes occur, his theory it must allow him to be flexible in revising his tactics of application and in revising the theory itself if necessary. (Glaser and Strauss, 1997, p.245)

The necessary condition to allow a user to judge fit, to modify the theory to their specific situation, and to use it to gain increased control, is that the theory is *understandable*. "A grounded substantive theory that corresponds closely to the realities of an area will make sense (have explanatory power) and be understandable to the people working in the substantive area. This understanding can be crucial since it is these people who will wish either to apply the theory themselves or to employ a sociologist to apply it" (Glaser & Strauss, 1978, p.239).

I have chosen for my project to adhere most closely to Glaser's model of grounded theory. My reasons for choosing his model relate to my purposes and understanding of the difficulties and complications of various methods. My purpose in carrying out this project is practical; I am seeking, as part of my professional activities, to improve the capacity of the school system to use data to improve student achievement. I am investigating how Superintendents can manage data for this purpose. The Ministry does not currently understand how Superintendents manage data, and consequently is unable to determine the best strategy to support data use. My hope is to be able to produce a study that enhances the ability of the Ministry to understand how Superintendents manage data and through that understanding provide more effective support to Superintendents in managing data at the school district level. I also hope to improve Superintendents' understanding of how they collectively use data, affording them increased capacity to predict what strategies might be best used in what situations.

In other words, I am hopeful that my study will help the education system better manage data use. This instrumental approach is consistent with Glaser's stated intention for grounded theory.

### **Literature review.**

In grounded theory, the literature does not direct the project; it supports it as a data source (Glaser, 1978). As this is the research approach I have taken, my findings and theory emerge from the analysis of the interviews of the Superintendents. I have used the literature to enrich and in some cases help elucidate the theory.

My findings and recommendations highlight three areas in which the literature is highly relevant. The first area concerns data-driven decision-making. The literature here provides a foundation for my claims about the importance of data to school improvement, establishing to some degree the significance of this dissertation project. My path through this segment of the literature took me from data-based decision-making specifically to the context of decision-making generally. The second line of literature strongly implicated by my findings and theory concerns the nature and patterns of engagement in organizations. This line of research led to an exploration of professional learning communities, collaboration, and the large question of the impacts of culture. Following the thread of 'data use' led me to the domain of knowledge management, also known as knowledge mobilization, and its roots in information management and information systems. The frame of knowledge management ties together the concepts of data use and engagement while adding the critical element of the role of technology in enabling the effective use of data.

Because the literature provides support and enrichment for findings and theory, I have related the literature to these elements, rather than writing the literature review as a stand-alone chapter.

## CHAPTER 2: GROUNDED THEORY

The grounded theory method is pivotal to my dissertation. It has guided not only the sequence of my research activities, but the development of the research question itself. The grounded theory method also establishes the general purpose of the research - to develop theory that will be relevant to the practitioner. Consequently it is important for the reader to understand the core precepts and methods of grounded theory in order to be able to assess my work, and determine whether it has been successful in meeting its purpose.

Grounded theory is an inductive method of theory development. Theory is literally "grounded" in data. Rather than beginning with a theory or hypothesis to test, the researcher chooses a phenomenon of interest and begins to collect data about the social processes related to that phenomenon (Glaser & Strauss, 1967). The main problems, patterns and hypotheses will emerge from the data. Grounded theory asks "what is the chief concern or problem of the people in the substantial area, and what accounts for most of the variation in processing the problem?" (Glaser, 1992, p.4). Different hypothesis are tested against the data to determine which appear to have the most explanatory power and plausibility.

Grounded theory methodology is characterized by an iterative and overlapping approach to sampling, data collection, analysis, and theorizing. The researcher establishes the initial sample, collects data and immediately begins analyzing it. The information from this analysis informs the next phase of sampling and analysis. Over a number of iterations different hypothesis are tested, and ultimately integrated theory begins to emerge. Glaser and Strauss (1967) suggest that these activities ought to be carried out

"simultaneously to the fullest extent possible; for this, as we have said, is the underlying operation when generating theory. Indeed, it is impossible to engage in theoretical sampling without coding and analyzing at the same time" (p.71).

### **Purpose of Grounded Theory**

Glaser and Strauss first developed the grounded theory method as a way of shifting the field of sociology from a preoccupation with verification studies, to a stronger focus on encouraging students and researchers to develop their own theory (Glaser & Strauss, 1967 p.viii). Grounded theory was designed to bridge the gap between narrative description and logically developed "grand theory" (p.10). The purpose of the grounded theories that were developed via the method was to provide explanation or prediction (p.3) - a standard positivistic rationale for theory development. Other proponents of grounded theory, whose perspectives are more constructivist have focused on the role of grounded theory in increasing understanding and acting as a heuristic to guide analysis. (Charmaz, 2006; Clarke, 2005; Clarke, 2003). There is substantial agreement that whether the goal is explanation, prediction, or understanding, grounded theory should have direct practical value to people who work in the substantive areas that are being studied.

Grounded theory does not attempt to re-create what people who are knowledgeable and work in the field already know. It does not focus on description or the provision of information. The role of Grounded theory is to provide explanation and understanding in order to increase the control of people in the field. It provides the expert with categories which can incorporate broad patterns, thereby allowing the expert to extend their knowledge, to anticipate additional consequences, increase the meaning and the ability to describe incidents by placing them in a larger context, increase the experts capacity to know by providing the concepts which encapsulate many incidents, expand and open up new possibilities and opportunities, develop the capacity to understand and organize the unknown more quickly,

become more comfortable with and better at adapting to change, and transcend the limitations of previous perceptions (Glaser, 1978, p.14).

### **Origin of Grounded Theory**

Grounded theory was first explicated by Strauss and Glaser in *The Discovery of Grounded Theory*, published in 1967. The two sociologists had collaborated on a book called *Awareness of Dying* and wrote *Discovery* to explain the methods they had used in that project. Glaser worked out of the Columbia University Department of Sociology, where he was strongly influenced by the quantitative methodology of Paul Lazarsfeld and by an orientation to the inductive methods of sociologists such as Robert Merton and Hans Zetterberg. Strauss' central influence was the qualitative tradition of the University of Chicago. This tradition stressed the need to get into the field to understand what is happening, the active role of people in shaping the worlds they inhabit, the centrality of change and process, and the importance of the perspectives of the participants. The University of Chicago was also associated with the philosophic school of pragmatism, which stresses the importance of experience, verification of ideas in the empirical world, and problem solving (Strauss & Corbin, 1990; Glaser, 1967). Glaser and Strauss wrote *Discovery* at a time when quantitative research approaches dominated the research scene (Charmaz, 2006), and their work helped to spread the legitimacy of rigorous qualitative research (Charmaz, 2005, 2006).

### **Schools of Grounded Theory**

Since 1967, when Glaser and Strauss wrote *The Discovery of Grounded Theory*, at least four schools of grounded theory have emerged. The first is represented by Barney Glaser and can be termed classical grounded theory. It stresses the need for the

researcher to avoid at all costs forcing data into preset theoretical constructs. The second school could be termed classical revised and was developed by Strauss after his break with Glaser, following the publication of Strauss and Corbin's book, *Basics of Qualitative Research*, in 1990. Glaser felt that Strauss had abandoned the idea of letting theory emerge from the data, suggesting instead "to constantly compare for a while, but then interrupt true emergence by asking many preconceived, substantive questions, which takes the analyst elsewhere from what is really going on, what is really at issue for the respondents and/or obscurities, what is relevant, and what would have emerged" (Glaser, 1992 p.4). The third school, represented by Kathy Charmaz (Charmaz, 2006) is a constructivist approach to grounded theory. In this approach there is still a focus on inductive research, but gone is the notion that what is being discovered is a basic process. The process as discovered by grounded theory is constructed, and consequently relatively fluid. The fourth approach is a fully post-modern rendering of grounded theory, articulated by Adele Clarke (Clarke, 2005). This school not only sees processes as constructed, but questions the notion that the process can ever be fully understood outside of a full explication of the situation in which the process takes place. While Glaser would say that any relevant context will earn its way into the theory, Clarke insists that the researcher must themselves make explicit what will often go unsaid by research participants.

I will draw most heavily on Glaser who has, since 1967, maintained a tenacious commitment to ensuring that grounded theory is indeed grounded in the data. I recognize however that all three approaches offer techniques and procedures which can be valuable



- particularly given that grounded theory is a relatively new and still developing method of social science research.

ELEMENT		CLASSIC		POSTMODERN	
		Strauss	Glaser	Charmaz	Clarke
Ontology/ Epistemology		-Post-positivist, inductive/abductive -Develop theory, extent to similar situations through theoretical sampling -Respondents represent “real” world	-Post-positivist, inductive/abductive, emergence -Develop theory, extend to similar situations through theoretical sampling -Respondents represent “real” world	-Constructivist, multiple realities -Truth is provisional -Heuristic	-Constructivist, relativist -Post modern
Purpose		-Generate new theory based on data -Predict, explain, plan action	-Generate new theory based on data. -Predict, explain, plan action	-Meaning making, understanding -Assist in study of change, tool of social construction	-Highlight complexities of social life, improve understanding of differences. -Open up data, highlight what is not being said
M E T H O D O L O G Y	Literature	-Initially contributes to theoretical sensitivity, later another source of data, and confirmation of theory	-Literature reviewed <i>after</i> theory developed - is then another source of data	-Literature important to establish credibility, but should not dominate theory development	-Review should precede study to help contextualize data -Should sensitize researcher of directions to look in but not what to see
	Data Collection	-Interviews, observation, texts	-All is data -Interviews, observation, texts	-Interviews, observation, texts -Quality is important	-Interviews, observation, texts, visual material
	Data Analyses/ Coding	-Open coding, axial coding, selective coding, theoretical coding -Comparison, asking questions. -Collection and analysis interwoven with coding	-Open coding, selective coding, theoretical coding -Constant comparison -Collection and analysis interwoven with coding	-Constant comparison -Interpretation begins with selection of data, not after data gathered	-Comparison, situational analysis using maps
	Sampling	-Theoretical sampling, saturation	Theoretical sampling, saturation	-Theoretical sampling	-Theoretical sampling
Theory		-Grounded in evidence, inductive, “fits” data set -Procedures very important -Theory is dense, detailed, fully described -Substantive and formal theory possible	-Emerges from data. -Procedures help, but should not replace emergence -Parsimonious, modifiable -Substantive and formal theory possible	-Interpretive, emphasize understanding -Needed to elevate research beyond description -Emphasis on “theorizing”	-Formal theory untenable, substantive theory possible, but always tentative -Emphasis on “theorizing”
Evaluation Criteria		-Generalization, reproducibility, verification -proper analytic procedures	-Fit, workability, relevance, modifiability, understandable, useful to practitioner	-Credibility, originality, resonance, usefulness	-Pragmatic: used -Clarifies without being reductionist

Figure 1: Comparison of Schools of grounded theory

## **Core Elements of Grounded Theory**

Although the development of grounded theory over the past four decades has been accompanied by an array of different and sometimes conflicting approaches and precepts, there is general agreement on certain core features of the method. Grounded theory involves *theorizing* and the development of theory, not description or verification; the theorizing is based on induction, not logical deduction or verification; data are gathered through theoretical sampling; codes are generated and connected through the analytical process of constant comparison; and, the sampling, analysis, and hypotheses generation are done concurrently and iteratively.

### **Theory, not description or verification**

From its inception, grounded theory has been seen as a method of moving beyond narrative description or hypotheses verification, to the generation of theory. Theory is understood to be the explication of plausible relationships between concepts that aid in explanation, prediction, or understanding of phenomena. (Charmaz, 2006, p.126; Strauss and Corbin, 1994).

### **Induction, not logical deduction or verification**

The method of theory development is induction. The process starts with an area of interest about which empirical data are gathered. Through means of inductive reasoning, themes and categories emerge from the data. As concepts are developed, hypothesis about relationships between concepts can be tested, with the most plausible explanation or hypothesis selected for the theory. Although the degree to which the hypotheses need to be tested or verified is a matter of debate amongst various grounded theorists, the

understanding that verification is in the service of developing theory is widely accepted. Grounded theorists also agree that theory must be developed from observation of the empirical world, and not through the deduction, or logical elaboration of ungrounded ideas.

### **Coding via Constant comparison**

The method of analysis used in grounded theory is constant comparison. The primary purpose of the constant comparison method is to generate theory using explicit coding and analytic procedures, though it is also used to check facts, establish a context, and verify hypothesis (Glaser & Strauss, 1967). The method is not meant to prove hypotheses or theories; it generates plausible suggestions for hypotheses about general problems, with the end product being integrated theory.

Because the constant comparison method does not require, or even allow, the researcher to stick to a preconceived research plan and set of data, a wide diversity of data becomes available to help develop the theory. This helps ensure that the theory that is developed is nuanced and well fitted to the empirical situation under investigation.

Using the constant comparative method makes probable the achievement of a complex theory that corresponds closely to the data, since the constant comparisons force the analyst to consider much diversity in the data. By *diversity* we mean that each incident is compared with other incidents, or with properties of a category, in terms of as many similarities and differences as possible (Glaser & Strauss, 1967, p.113).

### **Theoretical Sampling**

The constant comparison method of analysis is used in tandem with theoretical sampling. Theoretical sampling is aimed at developing the properties of categories, not

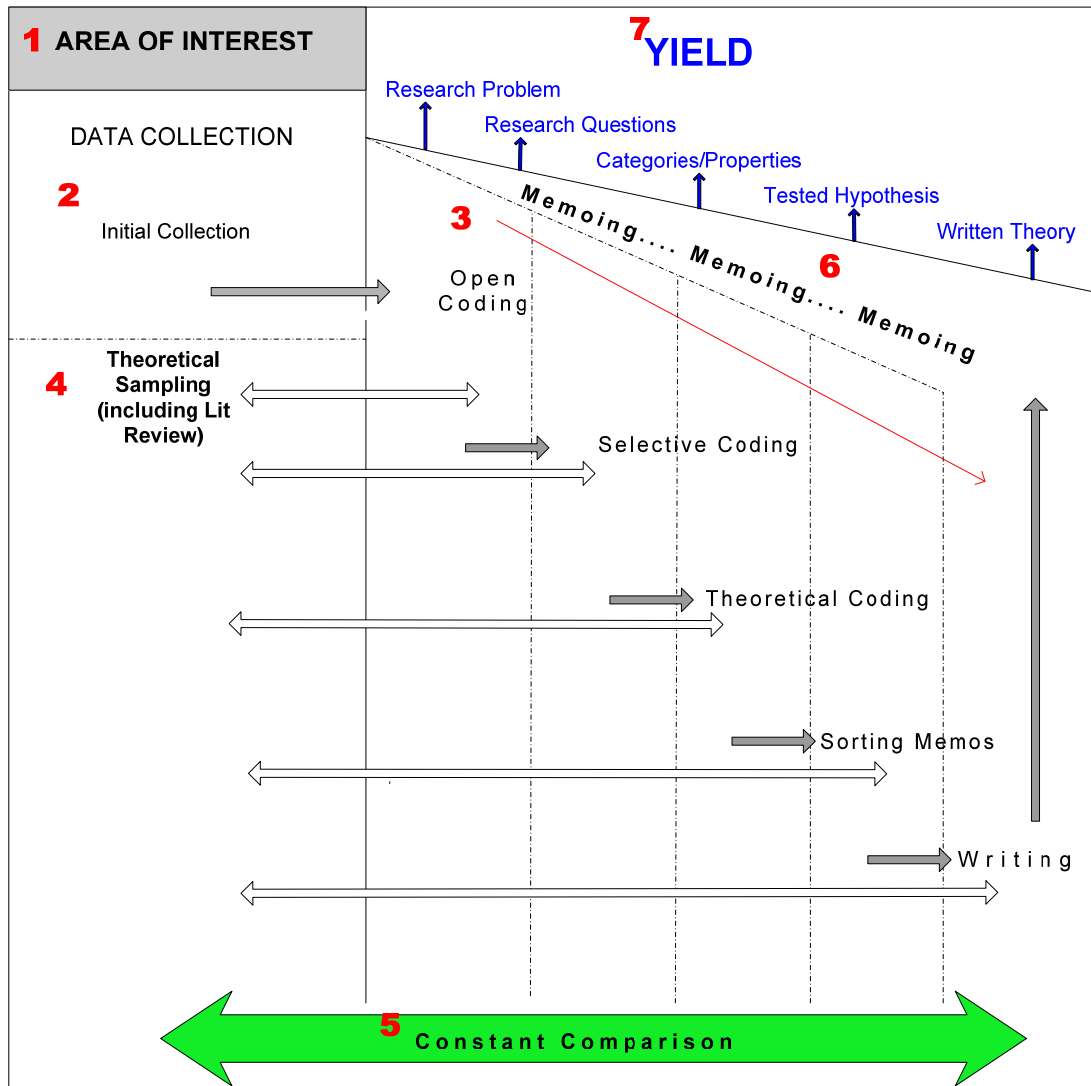
statistical selection of populations or groups within populations. "When engaging in theoretical sampling, the researcher seeks people, events, or information to eliminate and define the boundaries and relevance of the categories" (Charmaz, 2006, p.189). In the initial data analysis, when one is trying to establish the key properties of a category, keeping differences in the groups to a minimum will tend to bring out the most important differences. Later when one wants to extend and add to the properties, comparisons with increasingly dissimilar groups will yield more diversity and will also confirm the core similarities between groups. Theoretical sampling can also be used to increase the range and generality of a theory. For example, my project involves focusing on school district Superintendents - but if I wished to broaden its scope to education leaders in BC, I could add to the sample principals and vice principals, or perhaps trustees and Ministry personnel.

The process of filling in categories with new data derived from theoretical sampling continues until no new information emerges; when this occurs the categories are said to be saturated. The criteria for determining whether a category is saturated include "empirical limits of the data, the integration and density of the theory, and the analyst's theoretical sensitivity" (Glaser 1967 p.62). During this process the analysis of the data leads to increasingly abstract hypotheses, explaining more and more of the data patterns. Eventually one cohesive theory, which fits all the data, emerges as the dominant or most plausible explanation.

### **Concurrent coding/sampling/hypothesizing**

The interrelationship of constant comparison and theoretical sampling generates a set of activities that can be described but not planned in advance. The reason for this is that as the theory begins to emerge it directs the subsequent order and scope of activities.

How the analyst enters the field to collect the data, his method of collection and codification of the data, his integrating of the categories, generating memos, and constructing theory - the full continuum of both the process of generating theory and of social research - are all guided and integrated by the emerging theory. In contrast, traditional methods of theory development rely on standard methods of social research that are not directly formulated, controlled by or related to how the theory will be developed. This is typical in verificational studies, which use testing methods developed apart from the methods used to generate a testable hypothesis (Glaser, 1978, p.2)



**Figure 2 Classical grounded theory Process<sup>8</sup>**

1. The researcher establishes an area of interest.
2. Initial data collection takes place based on some sort of sampling.
3. Analysis begins with open coding and moves through selective coding, theoretical coding, sorting memos, and writing.
4. During the coding and writing, the researcher continues to add data through theoretical sampling. The literature is part of the data set that is sampled.
5. As the researcher codes, adds data, and writes he or she is constantly comparing code to code, incident to incident, category to incident, category to property, and category to category.
6. Throughout data collection and analysis the researcher writes memos on the categories and properties in order to create increasingly higher level analysis. Memoing takes on increasing importance and time as the researcher moves through the various stages of coding. In the end the writing process is mostly a question of integrating and rewriting the memos.
7. The products emerge: first the research problem in research questions, then the categories and their properties, the basic social and psychological processes, a theoretical framework, and finally written integrated theory.

<sup>8</sup> I based this framework on the approach suggested by Glaser. Although it is roughly sequential there is considerable looping back and forth between and among steps.

## CHAPTER 3: METHODOLOGY

### Research Plan

The engine of grounded theory - emergence - governs not only the development of theory, but the selection of a research problem as well as the research questions to be answered. Glaser (1992) counsels against defining a research problem at all. He suggests the furthest the researcher should go is to look into an area of interest.

The data collected as a result of this probing yields the research problem as well as ultimately, substantive theory in the area under investigation. It is difficult, however, in the dissertation process, to avoid defining a clear research problem and question prior to beginning field research.

My compromise has been to try and maintain a broad a focus on the research topic and problem and demonstrate, through reference to the method of grounded theory, that the specific research questions will emerge as the data are gathered. I have for example, avoided narrowing my research to looking only at how Superintendents use data for decision-making. There are many other processes for which data can be used: to set a context for future activities, to make a political statement, to justify activities, to organize and focus activities, to motivate change, to name a few. I did not specify whether the data of interest is quantitative or qualitative, whether there is or should be a distinction between data and evidence or results. Again, these distinctions emerge from the research. They are empirically grounded not conceptually imposed.

The second key point regarding sequencing of activities in the grounded theory methodology is the need to delay a full literature review until after data gathering and



analysis is well underway. The literature in fact, becomes simply another set of data to be analyzed. Theories and constructs from the literature help validate (or not) the existing categories derived from the field research, and may even contribute additional categories.

The research plan was guided both by the research question(s) and the requirements of the grounded theory method. These requirements dictate that many of the elements of the plan must remain highly flexible and adapt to the needs of the emerging theory. Parameters can however be established. Given that the area of interest is the way in which BC school Superintendents use data in their work the following constraints were applied.

1. Research was limited to the education system in BC;
2. Research focused primarily on BC school district Superintendents;
3. The main strategy for data gathering was in depth, intensive semi-structured interviews, with BC school district Superintendents who were either active or recently retired;
4. The research began with a small set (5-10) of Superintendents sampled to represent a diversity of districts. Subsequent interviews were governed by the precepts of the theoretical sampling. That is, the emerging theory pointed to areas requiring additional data and Superintendents judged to be best suited to provide this information were interviewed; and
5. After I developed a theoretical framework from the data gathered in BC, I reviewed the literature on data use as a data source to help validate, deepen and broaden my theory.

## **Data Collection**

My area of interest was how Superintendents manage data in school districts in BC. Since I was looking for a provincial level picture, my data collection was primarily based on interviews with 22 Superintendents, approximately one third of the province's Superintendents. My second source of data was the literature. Once I had thoroughly analyzed my interview data, and developed the main thrust of my theory, I turned to the literature to provide additional details to help enrich the findings.

### **Interviews.**

The interviews were done between October 2007 and June 2008. Each interview was recorded and took 1-2 hours. About half the interviews were done in person, and the other half by phone. The recordings were all transcribed and entered into AtlasTi, a software program designed to aid in qualitative analysis.

The interviews were open ended. The Superintendents knew that the general subject of the interview was data use. Apart from the first question, "What do you consider the role of the Superintendent to be?" there were no set questions. I carried out the interview as much as possible in the form and spirit of a discussion. As I was interviewing I kept a mental record of the subjects that were covered and if an important area such as how data was used did not come up, I would raise it.

### **Literature review.**

The literature search encompassed approximately 75 books, articles, and web sites related to data-driven decision-making, the nature and patterns of engagement in organizations, and knowledge management.

### **Sampling plan.**

I used a purposeful sample approach, choosing Superintendents of districts that represented as much geographical and demographical diversity as possible. The student populations of the districts that were sampled ranged from fewer than 2000 to more than 50,000. There were districts from the north east, north west, south east, south west and central BC. I also ensured that my sample included Superintendents whose experience ranged from less than a year on the job to over two decades.

### **Coding and Analysis**

I began coding as soon as I had the transcript from my first interview. I used a process of open coding. This entails closely analyzing the data line by line, asking questions such as: What is this data a study of? What does the data suggest? As soon as the first few codes were developed I was able to compare new codes to the others through my process of coding. As patterns of similarity emerged, I could consolidate the codes into categories.

Gradually, certain categories emerged as core, and I began to code only for those categories. This is the stage of *selective coding*. Eventually new incidents ceased to provide additional information on the category or its properties. At this point, I began *theoretical coding*, which connects and integrates the categories. I was no longer comparing incidents, but comparing category to category in order to determine a reduced number of key categories.

During the entire process of analysis I was *memoing* – analysing the codes and categories. The memos became units of analysis which I sorted and organized to develop the theoretical framework of the project.

### **Dealing with Preconceptions<sup>9</sup>**

If grounded theory has a single defining element, it is *emergence*. Theory emerges from data collected. Unchecked preconceptions can lead the researcher to force data into preset patterns, thus *importing* theory into a situation rather than grounding theory in the phenomenon under study. This decreases the likelihood of the theory “fitting” the situation and reduces its relevance to practitioners. Having said this, it is probably impossible to completely eliminate preconceptions but they can be managed and their impact minimized.

My approach was to begin by making myself aware of my own preconceptions. My technique was, in effect, to interview myself. I wrote down everything I could think of about data; what they are, how they might be used, what would help and what would hinder their use. I coded the text and analyzed it for patterns. By identifying and analysing my prior beliefs, assumptions, and expectations, I made them explicit. The awareness of my preconceptions made it possible to be more sensitive to situations where I might be forcing patterns on to data instead of letting them emerge.

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<sup>9</sup> The preconceptions of most concern are those that apply at which the level the theory is developed, i.e., preconceptions about what data are, how they might be used, what the barriers are, etc. Preconceptions (or perhaps more appropriately, perspectives) derived from a higher level of theory are not so problematic because they are unlikely to produce codes or categories that fit data from the substantive area. Indeed, the perspectives from higher-level theory may serve to deepen understanding of the mid-level theory. In the afterword I discuss how several concepts from the high-level theory of Jürgen Habermas inform and contextualize my theory.

Another type of preconception is to “weight” the data based on prior knowledge of the interviewee. Data from interviewees who are influential, with reputations for credibility and competence may carry more weight in the analysis. The antidote to this sort of preconception lies in the process of analysis and constant comparison. These processes break the data down so much that they lose their connection to a specific person. I broke the texts of my interviews into several thousand quotations organized initially by more than 300 codes. By the time I reduced the codes to several dozen key categories, all connections with specific interviewees had been expunged. Furthermore, when I re-attached the quotations to specific superintendents for the purposes of writing the findings, I substituted numbers for names. After several months of working with Superintendent “five,” or Superintendent “nine”, the real identities, along with any preconceptions about the value of their data, had almost disappeared.

A third preconception can arise during the literature review. In the same way that individual superintendents have reputations that can influence the data analysis, certain authors may also distract the focus of the analysis from the data grounded in the situation, to the ideas and insights the author. I utilized two tactics to minimize the potential of developing preconceptions from the literature review. First, I delayed the literature review until after my interviews, and after I had identified the main elements my theory. This gave me firm ground against which to test the fit and relevance of the literature. Second, I treated the literature as just another data source, putting it through a rigorous process of coding and constant comparison so that its relevance would also have to emerge. It would have to, in Glaser’s word, “earn” its way into the findings.

## CHAPTER 4: FINDINGS

### Profile of the Superintendents who were interviewed

These findings are based on interviews with 22 school district Superintendents in BC. Each interview lasted between one and two hours.

Five of the 22 Superintendents had retired within the previous five years. Fifteen of the Superintendents had worked as a Superintendent or district administrator for at least 15 years. Five Superintendents had been in their jobs two years or less.

Four Superintendents lead or had led districts of 70,000 students or more. Four Superintendents led districts comprised of fewer than 5000 students. About half the districts are urban and half are rural. Most of the rural districts have one or two small urban centres.

The following Superintendents, identified by pseudonyms, were interviewed:

- L. Anscombe; new Superintendent, rural district
- H. Barnard; small rural district
- O. Benjamin; midsize district
- Q. Box; large urban district
- I. Cochran; recently retired from rural district
- J. Cox; new Superintendent
- B. David; worked in rural districts for almost 20 years
- T. Effron; new Superintendent, urban district

- E. Elo; urban district
- D. Fisher; worked in urban and rural districts for over 20 years
- S. Friedman; midsize urban district
- U. Galten; new Superintendent, urban district
- P. Gosset; urban district
- R. Gumbel; new Superintendent, rural district
- F. Neyman; urban district
- C. Pearson; recently retired from midsize district
- V. Shainin; new Superintendent, large district
- M. Smith; new Superintendent, rural district
- G. Student; new Superintendent midsize district
- N. Tukey; new Superintendent, rural district
- K. Yates; worked in rural districts for over 20 years

For the purposes of writing this dissertation, the pseudonyms have all been assigned a randomly generated gender.

## **The Superintendent's Story<sup>10</sup>**

If the interviews of the 22 Superintendents were threaded into a story about one district, the narrative would unfold as follows.

### ***Chapter 1: Before data.***

The district collects no data itself; data relating to student performance is available from the Ministry, but the Superintendent has little interest in the data except to comply with regulations demanding annual accountability reports. The activities of district administrators, school administrators and teachers are driven by routines, entrenched cultural patterns, established power relationships, and intuition. The educational activities of teachers and administrators are characterized by a high degree of autonomy and isolation.

### ***Chapter 2: The beginning of change.***

The routine is interrupted; perhaps there is a new Superintendent; perhaps the School Board wants the Superintendent to manage the district differently; perhaps the Superintendent comes across data that is so compelling that they draw attention not only to the state of education in the district, but to the idea that data itself can be a powerful tool for change.<sup>11</sup> The Superintendent's challenge is now to introduce this new tool, data,<sup>12</sup> into the educational activities of the district. The Superintendent's first step is to

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<sup>10</sup> This narrative, in addition to summarizing my findings, introduces several aspects of my theory about how Superintendents manage data. I have been told that knowledge transfer s best when it is part of a story so in the spirit of learning and knowledge management, I offer the narrative as a complement to the analytically constructed text.

<sup>11</sup> Pages 2-4 of the Introduction describes how Aboriginal communities were able to use data about the relatively low achievement of Aboriginal students to pressure school districts to improve the quality of education they were providing these students.

<sup>12</sup> In the interviews Superintendents used the terms "data", "information", and "evidence" interchangeably.



ask questions about student achievement and student results. Staff begins to use standardized Ministry data to respond to the questions and initiate conversations about the meaning of their findings, but Ministry data soon appears inadequate to capture the full richness of learning in the district. The Superintendent begins to develop the district's own sources of data through activities such as district specific assessments, school wide assessments, and data gathered from administrative or diagnostic activities.

### ***Chapter 3: Deep discussion.***

The initial questions and conversations deepen into a discourse about student achievement. The discourse begins with staff discussing snapshots of the achievements of groups of students in order to determine whether there are general areas of difficulty that need instructional attention. This approach is later supplemented with a focus on discovering individual students who are having difficulty. A wide range of data is enlisted to tell a "story" of the achievement of student groups and individuals. The discovery of areas of difficulty for groups and individuals and the resulting focus of attention given to resources, programming or other strategies becomes the core function of the data. By default, the data that is collected is largely quantitative. Although the Superintendent will say that qualitative data are important, little effort is made to develop rigorous qualitative data processes. Data quality, initially downplayed in the search for data, becomes a topic of discussion. Questions of reliability, comparability, and validity emerge.

#### ***Chapter 4: Resistance and support.***

As more data are made available, the difficulty for administrators and teachers is to find enough time to gather the data, prepare it for analysis, and participate in the discussions. The problem of time is compounded by the participants' lack of experience, skill, and training in analyzing the data and extracting its meaning. The introduction of data as a tool for improving student achievement also draws resistance from some educators as it becomes clear that the use of data reduces the control teachers have over information about the performance of their students. Some teachers and school administrators fear the data will be used to judge them and even threaten their job security. The history and context of the district plays a major role in determining how difficult it is for the Superintendent to overcome the cultural/political resistance to the use of data. If relationships in the district are characterized by trust, respect and good will, the district will transition more easily to robust data use. If the district is characterized by power struggles between teachers and administrators, the introduction of data will become another battleground and the district will move forward at a slower rate as it works to balance the capacity to gather and use data with relationship shifts needed to support data use.

The Superintendent increases the resources allocated to supporting data use and organizes those resources to best fit the needs of the district. A program of professional development is implemented and technologies are acquired to help manage the data. Data experts are hired.

### *Chapter 5: Changing practise.*

The district now routinely incorporates data into the discussions, communications, and decisions by teachers, principals and district administrators. Systems are in place to ensure that data are collected efficiently; staff has the knowledge and experience to use it appropriately, and the district culture generally embraces data use as a tool to improve student achievement. Data are gathered at the individual level and includes a rich array of information about achievement, background, and learning activities. Individual level data supports grouping of students based on a wide variety of variables, making possible analysis of patterns of activity that “fit” the school or classroom, and better inform practise. Teachers are confident data are not used against them, and are used as an integrated part of instructional activities. Data are relatively consistent across classrooms and schools so that all educators have a common basis for discussion. Data about student achievement both generates and infuses discussions among teachers and between teachers and administrators. Data are used to find students who are in danger of not meeting educational outcomes and to stimulate discussions about school improvement. Data are considered in resourcing decisions at the school and district levels. Data are used for continuous improvement: to determine where changes are required, to help select the kinds of activities to effect improvements, to determine whether those improvements have occurred and, once again to look at where changes are required.

#### **What are Data?**

An important element of the interviews was to determine what the Superintendents considered data to be. Consistent with the precepts of grounded theory, I did not predefine data; I let the Superintendents tell me what they thought they were. The

Superintendents did so in response to a direct question about what data were and through the way they referred to data during the interviews. It rapidly became clear that Superintendents used the words "data", "evidence", and "information", virtually interchangeably.

Well, I'm redefining "data" as evidence (V. Shainin).

I think that now my definition of data would be anything that I use as evidence to inform myself or whatever in preparation for whatever it is I need to do (A. Nightingale).

I think it's any kind of information that you're feeding back to people so that they know how they've done (H. Barnard).

I say whether we call it data or we call it evidence, it has provided us with a clear understanding about something that's very important to us (V. Shainin).

Data, to me, is information that is, at its core, discreet pieces of information that collected en masse, coherently and in a manageable technological environment... So, I think of data as being a collection of pieces of information that together give you the bigger aspects of information that you need to do your work well (T. Efron).

Data are not seen as simply numbers or collections of things that *might* be relevant. Superintendents will only consider a collection of observations or numbers to be data if it is *already* clearly relevant to the needs of the district. That the data in some way needs to be useful before it is even recognized as something other than noise testifies to the interests of Superintendents in the practical value of data as a tool to help them carry out their work in general and decision-making in particular.

In order to have practical value, data needs to reflect truth. Superintendent Galten saw data as being a means for checking the truth of assumptions.

One of the roles of data are to challenge assumptions so that you can sort of do a little bit of a reality check that, you know, "Is it really true? Is our completion rate really this," or, "Is the \$100,000 we're putting into early literacy, is it really making a difference for children?"

Superintendent Pearson proposed that the truth of the data was what led to understanding.

Any information you get is a piece of data, and even all that qualitative stuff that you sort of get. Even the stuff you get at the barbershop where somebody says, "We like the job you're doing." All that stuff is a piece of data that goes into the hopper. And the pieces that it seems to me reveal truth, or reveal truth or somehow take us to a high level of understanding

He also associated the value of the data with its capacity to reveal or explain more of the picture.

... and some pieces of data that have just higher valence than others. But those are the ones that, I think, you've got to put some weight behind. And so you say, "Okay, all this says something to me, but which are the pieces I really want to pay attention to?"

So, the doctor looks at you, and he says, "My, you look good." Yeah, doc, but I got this pain in my chest, and I got one here, and I got one here." Now, those -he may- he may do an examination on you, and come up with fourteen other important pieces of data, but the ones he's going to respond are those three that are fairly glaring. So, he puts some valence on those pieces of data, those complaints that you provide to him.

Superintendents (Pearson, Fisher, Elo, Barnard, Cochran) often brought up the concept of "story" when talking about data/evidence/information. Superintendent Pearson characterized data as "pieces of the truth" that "spin together" to make sense as a story.

I think data are neither useful nor non-useful. It has neutrality into it until you can blend it into a story, or put it together in a trend line, or that there's something that can be attached to that data, some other decision being made relative to that data, some other intellectual process. So, the District has an overall FSA<sup>13</sup> score of 84. Is that good or bad? Nobody knows. Oh, 45 percent of our kids were excused from taking the FSA. Now, it's got a little bit more valence to it. And now it's got a little bit more of a story.

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<sup>13</sup> FSA is the acronym for Foundation Skills Assessment, a standardized assessment given annually to all students in Grades 4 and 7. The FSA assesses Reading, Writing, and Numeracy skills (Ministry of Education, 2009b).

### **Numerical vs. qualitative data.**

Although some of the Superintendents said data must be numerical, most held the position that they could be either numerical or qualitative.

Evidence. It can be - I've had it drilled into me by lots of people that it doesn't have to be numbers. I like numbers. But in terms of those phenomenological studies or phenomenological data, it's equally interesting. It's just 15 times as hard to look at (L. Anscombe).

Most of the Superintendents shared the view that although data could be non-numerical, they also recognized that credible qualitative data were difficult to find and hard to work with. Consequently most of the data examples the Superintendents provided were numerical. A Superintendent who had just finished cautioning that we must "find the balance so that we are not looking like we're chartered accountants running the bank ledger..." then proffered a list of useful data that included "the number of times in your school that kids - the number or percentage of your kids that are getting involved in good acts; the percentage of kids that are volunteering to work at the hospital on the weekends; the number of kids who are moving into, to apprenticeship programs" (T. Effron). Superintendent Effron also talked about the need to bring in "other observational evidence, the anecdotal, the culture, all of the evidences that contribute to the system", but did not provide any examples of what this evidence might look like. Many of the Superintendents commented that non-numerical data are problematic because they are difficult or impossible to measure or are unreliable.

I can accept that it [non-measurable data] exists but I'm not too sure it's data that is useful but not measurable. It's probably just not helpful, that's all. Any data worth its while has got to be able to be replicated (C. Pearson).

One Superintendent did note that although data did not need to be quantifiable they did need to be "consistently recordable" and could be a "set of themes that have emerged" (F. Neyman).

### **Data About What?**

About half the Superintendents referred to data only in the context of student background and achievement. The remainder, while focusing on data related to students, noted that their districts also pay attention to other data topics. Superintendents Nightingale, David, Cochran, and Yates spoke briefly about financial data, and Superintendents Nightingale, David, Pearson, Neyman, Student, Cochran, Tukey and Box mentioned human resources data. Superintendent Nightingale placed student data within a broader set of data needed to manage the whole system.

...certainly as Superintendent you've got that overseeing role so you do need to have indicators. You have sort of general information around how your whole system is operating and what about the financial information or student achievement information or human resources information and they're sort of like high-level and a dashboard, for various parts of the job depending on what the issue is.

While acknowledging that a broad set of data were part of the "data intensive environment," Superintendent Neyman saw most non-student data sets (e.g. payroll, tech department, workplace order system) as "just the stuff that keeps the wheels turning" and focused most of his attention on the "achievement front" because that was where the challenges were. Superintendent Student saw the student data driving staffing and funding decisions.

I don't know if I would say I think of financial stuff as data. But I think that financial decisions are driven by data. And I think that in \_\_\_\_\_, as an example, you know the collection of data around [students] at risk has

helped them make the decisions they made about where they, where they were going to push extra resources out.

Superintendent Yates described seeing, over almost two decades, an “evolution” of data use from data focused on “books, budgets, and buses” and the physical plant to data focused on “learning.” Superintendents generally saw data related to student learning as broadly based - encompassing demographic and socioeconomic data (C. Pearson, J. Cox, O. Benjamin), behaviour and intervention (K. Yates, L. Anscombe), social responsibility (J. Cox, H. Barnard), as well as a more academically focused student achievement (all Superintendents). Different Superintendents focused on different aspects of student learning data.

### **Integrating demographic data.**

Superintendent Pearson said that he starts his analysis by looking at achievement data such as FSA results, Primary Benchmarks<sup>14</sup> and graduation data. He would then add "all of this stuff that comes in from the community in terms of demographic indicators relative to poverty levels, the movement of families within the community, the movement of wealth within the community." Superintendent Benjamin noted that his district was working with a "vulnerability index"<sup>15</sup> that provided both school level and individual level information about students in kindergarten. Several Superintendents spoke about gathering social responsibility data related to behaviour in schools. Superintendent Cox also wanted to know how his students were acting when they were in the community.

We're putting a lot of effort into social responsibility, healing circles, restorative justice, positive behaviour support, trying to establish that

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<sup>14</sup> The BC Benchmarks Project features a set of information literacy (reading, research, resources) benchmarks (skills) that students need by grades 3, 7, 10 and 12 (Infolitbcla, 2009).

<sup>15</sup> Data describing the proportions of student populations who are socially or economically disadvantaged, e.g. are from low income families, single parent families, families with low parental education levels.



foundation of safety and positive behaviour in schools. But I'd like to know, if possible what happens from three in the afternoon to nine in the morning because if our kids are being good just because they're afraid, and we've got all these human surveillance cameras, and we've reduced suspensions; we're patting ourselves on the back because of all these wonderful things - is that learning? Is that behaviour improvement translating into the community?

### **Student achievement.**

The main data focus of all Superintendents was student achievement. The categories of achievement accounting for nearly all of the comments of the Superintendents were literacy/numeracy, behaviour/social responsibility, and transitions. All Superintendents referred to literacy data (expressed as reading and writing); about half mentioned numeracy, social responsibility, and transitions. The data on literacy almost always referred to Kindergarten-7, whereas numeracy data was most often related to secondary students. Literacy data also tended to have been in place longest, while several Superintendents noted that numeracy data was under development (S. Friedman, R. Gumbel, O. Benjamin). The category of 'Transitions' covers entry into school, grade to grade transitions, leaving school before graduating, graduating, and secondary to post secondary transition. In discussing transitions data, Superintendents were much more likely to focus on individual students than on groups of students. Superintendents (G. Student, I. Cochran, K. Yates, M. Smith) were interested in assessing early learning skills (especially reading) that often indicate whether the child will be "at risk" for learning problems in later years. The interest in transition continues as students move through the grades. Superintendent David followed a group of 14 Aboriginal students in grades 5 and 6 who were at risk of not transitioning to secondary school. The students were tracked for four years, and interventions made as necessary to help them succeed. In 2007, the Ministry provided each Superintendent with a list of their district's students who were

last seen in grade 10 and subsequently did not show up in school anywhere in the province. For many of the Superintendents, seeing the names of the missing students was a strong motivation to act.

We were able to get the list of names of grade tens, these kids have fallen off the register at one of your schools. First of all just seeing the names and counting them out told the story for different schools, but then being able to sit down with the principal and say, alright, we have got these names, we've got to find out what happened to these kids... (A. Nightingale).

References to the content of data were almost never separated from the way in which the data was gathered. This was most clearly evident in relation to literacy and numeracy data where the answer to the question of “what data do you have” was almost always framed in terms of the method of gathering it, with the specific instrument noted. For example, Superintendent Nightingale introduced her perspective on early learning data by referencing “kindergarten screens so that we can then say, ‘well alright how many of these kids don’t seem to have early learning skills that we know well predict success’ ...” To the specific question of “What kind of data crossed your desk”, Superintendent Pearson replied “... there’re the typical kinds of things, such as FSA data that everybody’s looking at.” A Superintendent who was new to a district indicated that his district had “basically no data” and indicated his first actions were to begin “... the whole class reading and whole class writing assessments, which we have been now collecting for two years. And we also began DRA<sup>16</sup> at the same time.” Superintendent Barnard saw little difference between the data and data collection method. In responding to the question “what is the current data you have accessible”, Superintendent Benjamin responded.

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<sup>16</sup> Developmental Reading Assessment for K-Grade 3.

We've got a whole-class reading assessment for basically Grades 4 and 9. We've got the PM Benchmarks<sup>17</sup> that we're using for primary grades. Of course our Grades 4 and 7 we're still using the FSA results. We started using the Island Net<sup>18</sup> for numeracy. And for the lower grades we really don't have an assessment tool for numeracy. We've got a Kindergarten assessment tool that is being piloted right now in a couple of schools. And then we've got provincials up at the higher level.

Descriptions of data relating to behaviour /social responsibility and transitions were also typically expressed as synonymous with the method of collecting.

### **Data Quality**

How do Superintendents distinguish between the data that is desirable, and that which is less so? What is "good" data? The criteria for determining quality included whether or not the data are used, the richness of the data at the level of the individual student, and whether the data are consistent and reliable. The following attributes appeared to be positively associated with data quality.

#### **The data are used.**

In keeping with the penchant of Superintendents to take a practical orientation to the data, an important test of data quality is the fact that it is used. L. Anscombe asked, "What identifies good data? Well, whether you actually use it or not... Good data? In the same sense, repeated use." The idea that data should be used was commonly supplemented by the criteria that the use should be directly related to instructional practise.

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<sup>17</sup> PM Benchmarks is an oral language monitoring/assessment strategy using grade-levelled stories and standard conventions and notations for assessment.

<sup>18</sup> The Vancouver Island Net Diagnostic Math Assessment. The assessment instruments cover learning from the end of Grade 2 to the end of Grade 9.

I wanted the data to, in most cases, be persuasive, and change -if at all- change our practise, or at least confirm our practise with a thundering applause that we are on the right track... the data either confirms or defines that we're going in the right direction (C. Pearson).

So for me, data are a very powerful tool to get people to ask questions, to reflect on their practise, to probe deeper (G. Student).

Several Superintendents underscored the importance of using data to inform practise by pointing out problems when it is not used in that way. Superintendent Barnard, commenting on the teachers in her district, said she was “disappointed in their level of understanding informative assessment as a practise.” Superintendent Nightingale stressed the need for teachers to see data as a tool, not a threat.

Somehow we have to find a way to make it less threatening for teachers especially, to be able to just use that information as part of really good professional practise where they are just not looking at something that is a reflection on them but as something that is a tool for them to use to help their kids to achieve greater learning.

Superintendent Cochran related a story of a district-wide math assessment that did not relate to any of the needs of teachers. “We did tons and tons of work around it. Nobody understood why. Nobody understood what was going to happen with it... the results were flaky because nobody was taking it very seriously, and that’s largely because it was top down. Teachers weren’t using it in their class.” She said that eventually the teachers just stopped using it, but as a result for a period of time teachers saw data as “dirty. It was a dirty word.” She now takes great care to avoid any data that “isn’t used by teachers in the school to inform decisions.” Superintendent Gumbel pointed out that even if one of the purposes of data is for district use that should always be a secondary consideration. “Like any tool that people are going to see as useful for their own personal use, as well as, also have this secondary to them, districts use. And quite frankly, it should be secondary to them.”

### **Richness of data.**

The concept of "richness" often came up when Superintendents were talking about what constituted good, useful data. Rich data are multifaceted, going beyond student achievement. "Now we're not talking about data in the brittle sense. We're talking about it in this expansive sense; its richness, and its potential" (D. Fisher).

Whenever the Superintendents spoke of rich data they connected it to individual students.

So it's more than just, what are their marks in Maths and Sciences. It's that kid knowledge. And that relationship kind of thing, you know, that's part of the database (G. Student).

But I'm actually more interested in students' data that reveals their experience and their learning. I'm not sure if achievement is a word I want to use, because it's so variably interpreted, but data that can reveal the student experience is the most interesting and useful data to me (P. Gosset).

I can go on for an hour about the kind of data that we need but it's all the data so you get to know that child, really get to know that child (B. David).

Superintendent David describes a range of data about the individual that would help improve instruction.

We needed to look at what kind of family supports are being provided - is there a mother there or is it a grandmother or is there a father in the picture or is her grandfather are there and send uncles that can help us support them - what's happening in their extended families, what's happening in their immediate family, what's happening in their village, what's happening or their home works in place are there - what kind of summer programs or other - so what I'm talking about all that I'm talking about what kind of anger issues does that kid have? the fetal alcohol I mean that literally I can go on for an hour about the kind of data that we need but it's all the data so you get to know that child, really get to know that child The richness of the data, however, has an important focus - the individual (this includes closest to the classroom) we see referenced a great deal of focus on good data being data about individual kids - and that a surety tied to the idea that data improves things for kids through the medium of improved instruction.

Superintendent Student described a database in his district that helped teachers keep track of a broad set of data about individual students at risk.

When we identify a kid at risk we have a little database that the teacher goes in and says, here's the support the kid has, here's what some of the challenges are. So that that information is readily available to the next classroom teacher, so you don't spend the first three months figuring out that Johnny doesn't live at home now. You know, there's nobody to check to see if he's getting all these other things that are impacting his learning. And you know he really needs to use a computer to write because his handwriting has been a real challenge for him.

The identification of individual students by name seemed to add a motivational aspect to the use of the data. When Superintendent Effron connected naming the kids to improving success, he was clearly suggesting that the identification process refocused educators on their mission - to make a difference in the life of the child.

If you really want to change it, you get down - you got to get down to almost naming the kids. You got to get down to what's going making a difference in the life of that child, to get them to graduate. Because at the end of the day, it's about getting little Sally or Johnny through to get their Dogwood and that's, I think, the level we need to get down to. Right down to the individual classroom teacher kind of level.

Superintendent Nightingale commented on her reaction when the Ministry sent her a list of names of 10 students who were last seen in her district and did not appear anywhere else in BC in subsequent years.

Being able to get a list of names like what we had - that was one of most helpful things that happened in a long time. We were able to get the list of names of grade tens these- kids have fallen off the register at one of your schools. First of all even just seeing those names and counting them out told the story for different schools but then being able to sit down with the principal and say alright we got these names we've got to find out what happened to these kids and so they went out and sat down with school principals and said what do we know what these kids and we learned a lot.

One of the most commonly mentioned elements of richness was the ability to follow students over time. "So I'm interested in this idea of, you know, that the tracking of children because, of course, it's that kind of longitudinal following each kid that yields the richest and most useful data" (N. Tukey). Superintendent Nightingale compared

looking at the information about an individual over time with taking a series of snapshots of different kids each year. “I guess over the last little while the way you view data, and again I’m thinking of the individual kid now, and realizing that it’s one kid who travels a journey in our school district, not a series of groups of kids that cycle through grade for every year.” Superintendent David talked about the need to have a kindergarten screen to provide teachers with enough information about individual students to be able to adapt to their instruction to the individual’s needs.

Now I don’t give a shit what you think about this philosophically, every child can have this because this is the start of getting to understand those kids at that age rather than waiting until they begin to fall through the cracks in grade 3. Because that’s what was happening; it was happening all over the place - people were doing their very best but they didn’t know the children well enough to know what worked and what didn’t work so they tried a bunch of stuff and all of the sudden the kid was not successful. Well we know what happened when those kids weren’t successful by grade 3 - they never caught up, even with mastery learning debate never - even with understanding the concept of accelerating instruction we did a lot of that works - they never caught up. They would come close but they would never catch up.

### **Rigour of process.**

Almost half the Superintendents connected the usefulness of the data with some form of technical rigour. Superintendent Neyman asserted that data are “most useful” when “it’s quantifiable and as scientifically collected as possible.” Superintendent Gosset felt that while it was rare to find “scientifically valid” data that does not mean it is “completely dirty. It doesn’t have to be absolutely rigorously “scientific.”<sup>19</sup> But some reasonable attempts should have been made to make it reliable to some extent.”

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<sup>19</sup> The Superintendents did not define what they meant by scientific, but the context of their references suggests that for them the term includes being quantitative, consistently collected, and reliable. Superintendent Pearson came the closest to describing a somewhat deeper aspect of ‘scientific’ when he said that any worthwhile data needs to be replicable.

Superintendent Pearson stressed the need to be able to replicate the data. “Any data worth its while has got to be able to be replicated, in my opinion... you hope you’ve got some ability to replicate it, and that it wasn’t just an accidental piece of fluff that just came trickling across your desk.” The most common term used by Superintendents in relation to the rigour of the data was “reliable.” (B. David, G. Student, H. Barnard, L. Anscombe, N. Tukey, P. Gosset, Q. Box). The term was not generally used as a specific statistical term, but more in the sense of being “believable” (F. Neyman). The specific qualities that made data rigorous, and not, “an accidental piece of fluff” revolved around the basic concept of consistency. Superintendent Neyman considered data useful “when it’s the right stuff consistently administered, collected for the purposes of understanding how we’re doing, and making plans and decisions for going forward, and in an environment where we can query it for that purpose.” Superintendent Anscombe saw the need for data to be consistent with a model that connects school, district, and provincial level data. Superintendent Tukey questioned the “validity” of data collected across schools using “different standards.” Superintendent Pearson also questioned the usefulness of “more localized testing.” Superintendent Nightingale noted a need for consistent class room level data: “Because people, when you start to ask people about their own assessment data, it gets very fuzzy because it isn't reliable, it isn't valid, it isn't credible.”

### **Sources of Data**

Superintendents generally conflated the source of the data with the data itself. The sources of data ranged from the individual judgement of teachers informed by an idiosyncratic mix of perception and data gathered from instruments designed by the



teacher, to large scale assessments using instruments designed far from the local classroom setting.

The types of data can be classified according to how closely they are linked to individual teachers. The data closest to the teacher would be report card marks, as the teacher has almost unlimited flexibility in choosing or designing a method of determining the mark. The next level would be classroom assessment where the teacher designs or appropriates an assessment instrument and applies it to the whole class either as a group or individually. The more commonly appropriated instruments were the performance standards<sup>20</sup> that provide rubrics to guide teachers in assessing student work. Instruments such as the performance standards can also be used across several grades or the whole school. School-level assessments will often be done with tests that have not been developed by the teachers administering the assessment. Examples of these tests are DIBELS<sup>21</sup> and PM Benchmarks. At another level farther from the individual teachers are the district-wide assessments. These can include district-wide “writes” of the performance standards in which teachers across the district attempt to apply consistent judgements, or involve the district-level application of the tests such as DIBELS. Beyond the district are the provincial level assessments such as the FSA and the provincial exams. International assessments such as the Progress in International Reading Study<sup>22</sup> (Mullis, 2007) or the Trends in International Mathematics and Science Study<sup>23</sup> which

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<sup>20</sup> The BC Performance Standards (Ministry of Education, (n.d.) were developed provincially by BC teachers. The performance standards describe and illustrate four levels of student performance in terms of prescribed learning outcomes relevant to the key areas of reading, writing, numeracy, social responsibility and information and communication technology.

<sup>21</sup> Dynamic Indicators of Basic Early Literacy Skills is an early literacy screening instrument.

<sup>22</sup> An international assessment of reading skills of 15 year-olds. BC students are sampled.

<sup>23</sup> An international assessment of mathematics skills of students in grades 4 and 8. BC students are sampled.

include only a sample of schools and classes in the province, were mentioned by only one Superintendent. This may be because the data cannot be used to identify individual students, nor is it reported by class or school.

Another way of understanding the wide variety of data sources is to arrange them on a continuum of standardization. At one end are teacher generated marks as expressed in report cards and at the other end provincial examinations. Teacher generated marks do not only not have to be consistent with what another teacher might assign for the same work, but the method does not even have to be consistently applied across a teacher's own classroom. This lack of standardization provides teachers with high levels of autonomy. Standardization first begins to emerge when a teacher gives a whole class the same test. These tests can range from quizzes created by the teacher, semi-standardized assessments, such as the performance standards, where a common rubric guides the teacher in assessing levels of performance, to standardized instruments in which the teachers' autonomy is expressed in the choice of the instrument. A school wide assessment provides yet more standardization. If the assessment involves performance standards, teachers will generally relinquish some individual control to work together to generate consistency of administration and application of the scoring rubrics. Teachers' individual control is further diminished and standardization enhanced if the performance standards are applied at the district level. Where assessments draw on fully specified instruments such as DIBELS, the content is completely standardized but the timing and reporting of results provides some level of individual teacher control when done at the classroom or school level. An individual teacher's control virtually disappears when an assessment is performed district-wide. Of course the most standardized data processes in

terms of content, timing, scoring, and reporting are the provincial instruments such as the FSA and the provincial exams.

### **Individual student assessment: Report cards.**

About half the Superintendents mentioned report cards. Of these, all but two noted concerns with report cards as a data source. The problem ascribed to report cards as a data source was the high degree of subjectivity, leading to inconsistent representation of student achievement.

I stopped using report cards because they're so subjective and they'll change from class to class. Not only will they change from class to class but what the teachers decide to teach in the IRP<sup>24</sup>s or how they teach or what importance they put onto it changes, so we stopped using classroom report card marks (O. Benjamin).

Superintendent Shainin characterized report cards as “something to look at” but also noted “we don't know what the standards are.” Superintendent Fisher was concerned that report card marks tended to be much higher than standardized assessments: “You've looked at the assessment results and the report card marks and they are just way up there. You look at the learning assessment scores and they're really down. And you're saying why don't these two things fit together?” Superintendent Smith, whose district was just beginning to collect data, recognized the weakness of report card marks, but felt her district needed the data: “We know all the arguments forever between letter grades, right, and they're not consistent, etcetera. But at least it's a start.”

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<sup>24</sup> Integrated Resource Package. Publication of the Ministry of Education bundling curriculum outcomes with instructional and assessment resources.

### **Classroom assessment.**

Whereas the student assessments discussed above are characterized by considerable variation in the assessment tools and in the criteria applied to each individual student, classroom assessment to some degree standardizes the tools and criteria across the classroom. A classroom assessment normally involves using the same assessment instrument for each student, and having a common standard for grading. “We have a group put together to look at what classroom-not individual but classroom reading comprehension assessment can we use?” (M. Smith). About half the Superintendents discussed classroom assessments and many spoke quite forcefully about its value. Superintendent Neyman spoke about the need for “really good data, and on the achievements front, that means high quality authentic classroom-based assessment data.” Superintendent Fisher offered a clear example of teachers developing a set of classroom based data:

You get two teachers in a room. And they each have a child read to them and they score on this basis. You know in an hour and a half you sample the whole classroom. Or in three hours you sample a whole classroom, you have a powerful piece of classroom-based data. We need to move more to that.

Superintendent Cochran linked classroom-based data to data that teachers can use: “We need to continue to find data or evidence that’s classroom based, that’s more tightly tied to the classroom... We only want classroom data, and we want stuff that we can use, that teachers use in the classroom to inform instruction...” His district provided support for teachers who wanted to develop their own assessments.

We used that same model for assessment, in classroom-based assessments. Tell us who, what are your questions? What are your concerns? “Well, like, I don’t think [name of assessment omitted] does this. I don’t think [name of assessment omitted] does this. I’d like to tinker with that piece of it and see

if I can come up with something better for my kids and what works in my classroom... “Yeah, okay, great.” Off you go. “Let us support you.”

To Superintendent Smith the power of classroom data was that teachers could clearly see their students in it. “The closer you get to the classroom the more important it is, because unless you're there-if teachers see big data, "Oh yeah, but that's not us." It's easy to dismiss. When you see it at the classroom level or at least at the school level, it's not so easy to dismiss.” Superintendent Barnard noted that in a small district, classroom based assessment may be the only kind that makes sense.

The classroom data that we have perhaps needs to somehow work its way into the bigger picture so that we really are just using classroom data. And that makes sense for little places, because our cohorts are too small to be paying attention to a large-scale assessment plan. I mean, FSA doesn't mean a lot to us.

While some of the comments Superintendents made about classroom based data envisioned data unique to each class, most of the Superintendents saw classroom based data as needing to encompass a school and district perspective. Superintendent Anscombe: “So they're having to coordinate gathering data from the classroom and merging it with their school stuff, and then layering in there the overall district.” Superintendent Neyman, a strong proponent of classroom based assessment, outlined the elements of a “conceptual framework” around which the district could organize data. He first emphasised the need for high quality assessments that support teaching and learning: “So, that conceptual framework that I really need us to have is that first of all, we have teachers, administrators, parents, kids, everybody then gets the notion of the importance of commonly administered quality assessments to support teaching and learning.” He then points out the need to generate school and district-level analysis from the data.

What they - I need from that is the extension into - and we're okay with our having captured that assessment data in the classroom, knowing it's

consistent with our neighbouring classrooms, being collated for school and district planning purposes. That's the framework that we need and that's what makes data useful for us.

Superintendent Cochran, who was funding teachers to develop classroom assessments, wanted data that could "be rolled up to some sort of school profile that can be rolled up to some sort of district profile." Superintendent Anscombe noted:

What we're trying to do now, now that we've got people involved with the leadership groups working with data, what we want is we're looking for teachers to take that same "what do I believe, what do I want, what do I know" and bring their own classroom assessment data through that cycle.

### **Ministry data.**

All but two Superintendents either mentioned or spoke at length about data that came from the Ministry. Although Superintendents frequently use the term "Ministry data" or "provincial data", the labels are somewhat misleading. It might be more accurate to identify the data that the Ministry analyzes, stores, and reports on as "Ministry held" data. Almost all of the data the Ministry works with is collected from schools. It is provided to the Ministry to be analyzed and reported back to schools and districts. The role the Ministry performs is the development of assessments or surveys and storage of administrative data. The Ministry also links some of this data to individual level data available in other ministries in order to provide a richer picture of student achievement. A small proportion of what is considered "provincial data" is data gathered by the Ministry from organizations such as Statistics Canada and BC Statistics to provide school, community, or district-level demographic and socioeconomic context to the performance data.

The Ministry data sets that Superintendents noted included the FSA, transition data, Satisfaction Survey data, provincial exams in grades 10, 11 and 12, and completion

data - grade 12 completion and Dogwood<sup>25</sup> completion - and occasionally socio-economic data related to school communities and school districts. Of these, the FSA was by far the most frequently mentioned.

About half the Superintendents simply mentioned that Ministry data was available and being used in their district. The others, however, commented at length on Ministry-held data. The comments fit a general pattern describing four distinct district phases. The first phase is marked by a district having very little data to draw on except that provided by the Ministry.

When I got there, there was, basically, no data. And the only data that the district really had anywhere was what was in the Ministry's collection. So, we had no central system for which data was being collected. And then I think beyond that it would be things like government exams, scores, and attendance, transition rates between greats. But it's all brand new for her district in the world of collection data. So, the Ministry is supporting us with what they knew about FSA or government exams, that type of thing but, otherwise, it wasn't any district selection going on (H. Barnard).

In the second phase districts emphasize the collection, analysis and reporting of their own data. Generally, districts are looking for data that provides more local perspective.

We've got good access to good data for FSA, good access to good data for satisfaction surveys, for provincial exams, for, you know, all kinds of things that are more on the provincial level. We're missing the local high-quality, rich, thick and deep assessment instrument evidence (F. Neyman).

Superintendent Cochran spoke of moving from a situation where staff would say "it's not a number; we can't use it" to looking for a broader evidence on which to base understanding. Superintendent Barnard, who began his superintendency in a district with extremely sparse local data, was anxious to move beyond standardized Ministry data as

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<sup>25</sup> The Dogwood Certificate is the official recognition by the Ministry of Education that a student has met BC secondary school graduation requirements. It is also known as the British Columbia Certificate of Graduation.

soon as possible. “The classroom data that we have perhaps needs to somehow work its way into the bigger picture so that we really are just using classroom data. And that makes sense for little places, because our cohorts are too small to be paying attention to large-scale assessment plan. I mean, FSA doesn't mean a lot to us.” Superintendent Anscombe, whose district that had been relying primarily on Ministry data, emphasized their efforts to embrace formative assessment at the district level.

We have, obviously, there is the stuff from the Ministry you know, with FSA, and so on, but more and more, we are getting – we are creating our own common assessments. We're creating both qualitative and quantitative assessments. We're discussing a lot of that. But I think - I think the biggest push - and it's coming easier the primary and elementary than it is at the secondary - is around formative assessment.

One of the reasons for this may have been that Superintendents perceived that the FSA, while useful for accountability purposes, was not engaging teachers. “We use the FSA data somewhat in terms of our achievement contract and somewhat at the district level, in terms of making resource allocation decisions. I don't get a sense that FSA is really being used much for the purpose of informing instruction” (S. Friedman).

A third phase begins when Superintendents begin to revise their opinion about the value of Ministry data.

I mean the first response to FSA, many years ago, was extremely defensive "it's meaningless" etc. etc. "it's a plot by the Fraser<sup>26</sup> Institute. I as a matter of principle won't even look at it" you know we challenge that point of view by saying "well let's just look at it now. It's performance-based, and it's based on curriculum," and so on and so forth. We moved people toward the, "yes but it's only a spot data it's a snapshot it's not complete". And then we had a discussion about how that's true of all data. And I think we've gotten to the point where it notwithstanding the BCTF campaign<sup>27</sup> most

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<sup>26</sup> The Fraser Institute is a think tank that claims as its motto “a free and prosperous world through choice, markets and responsibility (Fraser institute, 2009).

<sup>27</sup> The British Columbia Teachers Federation is officially opposed to the FSA assessment program (British Columbia Teachers Federation, 2009) and has campaigned to limit teachers participation in it.



teachers have had at least accepted the fact that this data comes from a reasonably decent place. They dispute some of the complexities of the data gathering process, and so on and so forth, but most people are willing to look at it now (P. Gosset).

Superintendent Pearson said that his district was gradually increasing the proportion of Ministry held data used in his district.

We used to do a lot more district data collection. And it wasn't as comprehensive, because we were trying to make sense of out of local or adapted test data that we could do with students. And, you know, the Ministry stuff is pretty well taken over simply because it's far more comprehensive, and it's predictable, and it's year by year, and it can be evaluated in a dozen different ways.

Having become more aware and proficient in the use of data the Superintendents began to see areas in which they could replace their local data collection with Ministry data and in doing so improve both the quality and the richness of the data.

We thought we were getting collecting some very important information through school-based surveys we were doing although as the Ministry perfected some of their surveys we stop doing some of that stuff because the Ministry was doing - it went from 70% about seven or eight years ago the district a project with 30% Ministry, now I would say it's probably 50-50 and it'll go I'm hoping it'll dropped. I'm hoping the Ministry will provide more and better data to school districts in ways that are more easily manipulated or the Ministry will provide some of those services (B. David).

Superintendent Tukey described realizing that the FSA could be made relevant at the school level.

Well, you know, despite all the controversy around at the state, I was finding that, for instance, the item and analysis was becoming a very useful tool on the FSA in terms of conversations with schools. And the last few years prior to 08 you could see the trend particularly if you monitored on a district or on a school level to see where things were working out or not working. So I found the data of very interesting conversation with my principals in terms of focusing and trying to get them to focus instruction in their classroom.

A fourth phase is the integration of all kinds of data into a framework that focuses on assisting the long-term development of students. Superintendent Galten contrasted a

traditional way of planning, using aggregated information, with focusing on individual students.

We've taken a look at the evidence we have around student achievement and said, "we believe that the ways in which we've been planning, i.e. taking traditional, provincial or school or district assessments like FSA or DART<sup>28</sup> or Benchmarks or whatever, that it's hard for us to generate teacher buy-in an school buy-in and SPC (School Planning Council) buy-in in terms of planning in that way". And we're shifting to a mode where we've asked our teachers in every grade to identify in every course students they believe to be at risk.

This approach was expressed by Superintendent Nightingale as fitting all of the pieces of data into a coherent story that linked kindergarten teachers to grade 12 teachers.

The pieces of information started to fit into a context that made sense so that it was about an individual or group of kids journey over that time and so it wasn't just literacy FSA reading in isolation... reading, math, writing, their social responsibilities... all that kind of stuff started to make it more sense when I looked at everything over that continuum and then we start thinking, well okay everybody always thought completion was sort of a secondary thing, all of a sudden [completion] become something you can talk to kindergarten teachers about.

## **The Use of Data**

While Superintendents all felt the overall purpose of data use was to improve student achievement, they saw data as specifically playing four key roles: enhancing accountability, supporting communications, initiating and sustaining discourse, and supporting decision-making. Each of these roles develops and deepens over time as district staffs<sup>29</sup> gain experience and proficiency in using data.

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<sup>28</sup> District Assessment of Reading

<sup>29</sup> In this dissertation I use the words "district staff" or "district staffs" to refer to all educators in the district, from the Superintendent to teachers.

## **Accountability.**

Superintendents generally spoke of accountability in relation to student performance. Discussion focused around definitions of accountability and issues of who is accountable to whom.

### ***What is accountability?***

Superintendents supported accountability as a legitimate goal in itself: "... there's room for accountability in the best sense of the word and that, I think that's critical" (D. Fisher). Superintendent Elo was unconditional and unequivocal in his support for accountability. "Of course, we're accountable. I mean somebody's got to sit me down and explain why somehow that became a dirty word. I use it all the time. My God, this is- these are kids. Of course, we're accountable." Superintendent Effron framed accountability both as a statutory and moral requirement. "Accountability to the Board, accountability to the public, to our students, to the Ministry. And that's ensuring that we're meeting not only statutory requirements, but our moral and legal obligations and just obligation to serve the public."

Superintendents did not see accountability as a process to find fault or blame. The most prevalent view was that accountability was the requirement first to know what is going on and second to be transparent, so that others would also know. Knowing what is going on increases the Superintendent's ability to provide support where it is needed. "So, I think the accountability, not in terms of 'measure up or be in trouble', but the accountability in terms of scrutiny and support comes through a data rich environment, where there's coherence" (F. Neyman). Not only the Superintendent, but all staff needs to

know what was going on in terms of student achievement. This awareness would mean that all staff would become accountable.

...they brought forward to their staff - here's the latest from the school from the Superintendent in the district here's the latest from the district [administrative]staff this is what the district wants us to do right and here are our results. And here are results compared to other schools, similar schools in the school district and similar schools in the province and that created a real awareness for teachers as well - I don't think anybody figured they could duck it anymore here it is its in their face, nobody's getting angry at us - nobody's saying we're not doing our job - you know you must do this or this here it is here's a conversation, so I tried to frame that in a way for principals that let them know that everyone was accountable for the results but that wasn't going to happen overnight (B. David).

The acknowledgment that acceptance of accountability for results was going to take considerable time was made by many Superintendents. Accountability was seen to conflict with autonomy, a cherished value for many teachers; “even today, there are lots of places where teachers are completely autonomous in their classroom and they are accountable to no one, other than you know, to some extent, their principal. But you know classroom doors traditionally have been shut” (G. Student).

Some Superintendents felt that the emphasis on accountability needed to shift to an emphasis on responsibility. There was a sense that accountability was an important step in generating awareness and breaking down an isolationist kind of autonomy, but the real goal was to have each educator take responsibility for the achievement of students.

### *Who is accountable to whom?*

Districts with a fairly short history of using data tended to speak of accountability in terms of reporting to the Ministry. One Superintendent spoke of using data to "complete my accountability piece to the Ministry" (N. Tukey). The 'accountability piece' has not traditionally been something integrated into district activities.

It's really evident that the way things have evolved where they're asking for information and plans based on data, and then asking for accountability based on data, and that slowly has herded me as a Superintendent certainly, in responding to that and, therefore, communicating that out to my school district (N. Tukey).

Superintendents who have been working with data for a number of years acknowledged that Ministry pressure for accountability, particularly through the district's Accountability Contracts, stimulated a deeper engagement with data.

I think the introduction of the Accountability Contract really was a big focusing agent for our district. Before that, it was hit and miss. There was data being collected, but it didn't have that cohesiveness that the achievement contract [really brought], and that framework from which the school district could operate. So I think if you had to look at the-sort of the turning point for us as a district, that was the real significant piece, and it really pulled things together (R. Gumbel).

Having been stimulated to use data through the provincial requirements for accountability, several Superintendents have moved their districts to the point where the Ministry required activities are almost irrelevant to district needs. These Superintendents have taken full responsibility for the use of data to improve student achievement, and the accountability function has become a side effect of their ongoing district and school processes. One Superintendent stated that in an ideal world the district would not even need to use data collected by the Ministry "literally, we would take care of ourselves" (J. Cox). This Superintendent saw Ministry requirements for accountability as lagging behind his needs to focus data use on improving student achievement and to engage all district staff in this endeavour.

### **Understanding and communications.**

Data plays a major role in the Superintendent's ability to understand the school district and to influence the way in which the district is perceived by educators, students

and the community in general. Data are also a crucial element in the Superintendents ability to communicate with staff, the board, and the public.

The Superintendent is expected to have "general information around how your whole system is operating and what about the financial information or student achievement information or human resources information and they're sort of like high-level and a dashboard, for various parts of the job depending on what the issue is" (A. Nightingale). The Superintendent needs this information to "help somebody else make sense of it, to demonstrate a point or make a presentation or make a decision or whatever the deal is, you're rarely doing it just because you're the only one that needs to know" (A. Nightingale).

Knowing the data is one of the ways in which the Superintendent can inspire confidence. "... there's a comforting, there is a political, in the best sense of the word, a political dimension to the effective use of good information" (T. Effron). Superintendent Pearson related how her best principals (recognized nationally by their colleagues for excellence) literally carry their data with them. "All... of them, they - believe it or not carry around a notebook. And the notebook has a daily performance criterion for every single student in the school."

Superintendents promote increased awareness and understanding for parents and the community. Superintendent Nightingale wants to ensure that parents are clear about what is being said in reports on the progress of their children. Superintendent Galten would like parents to understand when they can "feel at ease" and when they "need to be asking some questions and really seeking support."

So, wouldn't it be an interesting thing to just be able to communicate to parents to say, "You should just be aware of that. If your child has four schools in their elementary years, the chances of them not receiving a Dogwood are-you know, increased by triple. You should just be aware." It's just an awareness thing (U. Galten).

Superintendent Cochran talked about using data to expand awareness and understanding to the community.

A big part of the community work is around data and trying to, and maybe it's not part of the mandate, but I try to bring sort of data awareness to the community, to understand what is going on in our schools, to understand why we get the results we get, to understand why those things kind of happen. As opposed to letting the Fraser Institute do the talking, we try to do the talking.

Some Superintendents saw data as a way of promoting "deep understanding" (F. Neyman). This goes beyond 'awareness' in that the data does not merely answer questions, but raises them as well: "we review data or look for data, to answer a specific question. And other times I think we use data to answer more generalized questions or even leads to subsequent questions" (T. Effron).

When data are part of an ever deepening cycle of questioning it can open up new perspectives.

But I think data leads us to, or can lead us to a clearer vision or even towards new ideas. Sometimes just reviewing information and looking at things in a new context or through a new lens, leads us to sort of visionary choices. That it helps us to maybe re-think or re-format our concepts that we hold and that's a good thing. It allows us to look at the world or our situation in a different way, which can very much change where we're going.

So I think it aids, not only in answering questions, but it can be a real asset in creating vision. Or certainly challenging the status quo that we may hold. Which is a good thing (B. David).

The data are also used as a tool of persuasion and change. Referring to the low achievement of Aboriginal students, Superintendent David wanted to get "more people to buy into that this is not just a school problem or a teacher/student problem, it's a school

district problem, community problem, regional problem, provincial problem in many respects.” He used the data to establish the nature of the problem and to bolster an argument for increasing resources for Aboriginal learners. “My job was to frame the data, the achievement data within the school district in a way that demonstrated a need for services in support of Aboriginal learners within their individual communities.”

### **Supporting discourse.**

A third role of data is to initiate and support broadly based discourse about student achievement. Discourse is seen as an important strategy in breaking down isolation within schools, between schools, and within the district generally. For some districts, the discussions began with a focus on how to talk about data. Using the data for discussions about improvement of student performance would come later.

What we did was we collected the data the first time, and worked really closely with the principals at building some understanding of how to talk about it. And then they went back to their staffs. And then I did a round through - I did a learning conversation in every school with whatever team that the principal could draw together to have with me (H. Barnard).

Superintendent Barnard worked with his schools for a year: "anytime anybody was together, the focus was on how to talk about data."

The conversation about talking about data eventually leads to a conversation about the data itself. As staff began to acclimatize themselves to the idea of data, they begin to see it is less threatening and potentially useful.

There's not the same need to explain it away. Again, I think I've said it about five times now, are we where we want to be? No. But we don't have principals coming in and trying to hide the data, or fall on their sword when they get it, or trying to find excuses me (H. Barnard).



Superintendent David saw extended discussion as a way processing the data and preparing the participants to make better decisions.

There's a whole bunch of stuff that has to happen around data reveal - that's the beginning of the analysis piece, well let's talk this through let's ask some good questions let's frame some good questions. We used to do that at staff meetings and district staff meetings - let's come up with three or four good questions toward him and go out and talk to each of our principals about and get them - because we know that once we talk to them about it there to take it back to the staff and the SPC and there you have these conversations as well and then eventually through those number of discussions, those questions through some of the stories that are going to be told they're going to be able to make better decisions around the data.

Others believed that the value of discussion went much beyond improving the decision-making process. Superintendent Cox noted that even if the data had no purposes other than inspiring conversation it would be worth having: "And if I want to really simplify it, if data does nothing more than inspire teachers to share and talk to one another, then that'd be a good thing." Superintendent Student stated simply that "the conversation is what's powerful - not the data." The value of data is that they generate questions that get the conversation going.

So for me, data are a very powerful tool to get people to ask questions, to reflect on their practise, to probe deeper. So you know you get a set of data and it says, you know, 62% did this. Well what does that mean? Who are the 62%? Who are the people that are succeeding? Who are the people that aren't succeeding? What - I mean it doesn't, the number itself, the data itself is really just the starting point of our conversation (G. Student).

Superintendent Benjamin emphasized that the conversation is about improving instruction and that the data "just that moves them along."

The following quotation from Superintendent Student describes how the conversation initiated by data gets deeper through questioning and eventually becomes a cycle of inquiry.

...we were doing some work around physics results. And we were trying to understand why girls did better on our provincial physics exam than they did on the international physics exam. And it really, it became a very interesting conversation. Because on one level, it was pretty easy to analyze the types of questions that were on this exam, and the types of questions that were on this exam. And what level of reasoning was really involved. And how much was just, you know, plugging numbers into formulas. And how much was taking it and applying it to a situation that they might have seen before, and how much was innovative.

But as we really started to look deeper into it, we got into a whole discussion about teaching practises. Like it just led all kinds of really interesting places...But the deeper we dug, the more we realized that the surface conversation didn't even begin to touch that... and I think, I mean it's really, it gets, it almost takes and gets you into an inquiry cycle, an action research kind of cycle that says this is what I think I know, and this is what I think I need to do. And I'm going to try it and well, the data doesn't say, you know. But it's the sophistication of the conversation about the data that really starts to get people into changing.

As the flow of the discussions wove through questions of how to use data generally, how to understand the data that is available to the district or school, and how to apply the data, the participants became more engaged.

...that's led to a much richer just kind of a conversation. So we now have teachers asking for - "Can we move to a district-wide use of? Can we collect this at the district level? Can you do that for us?" Yeah, we can. Absolutely, we can do that if we get some agreement, because they're initiating it. They're seeing it affecting what goes on in their class, or they're curious to know how that plays out at other schools. "How was this- is my classroom, is my school different in some way than the other school next door? Or how, so we'd like to know how our kids stack up against the district in this" (I. Cochran).

Eventually the conversations break down the isolation of different parts of the system. This happens as participants see the relationship between their work and others in relation to the complete "journey" of the student. Superintendent Gumbel described that kind of conversation as one in which a kindergarten teacher might say: "if I don't do my job, they won't graduate."

### **Decision-making.**

The fourth of the major functions of data are to support decision-making.

Decision-making is a process involving three major activities: defining the problem; articulating a set of alternative responses to choose from; and choosing a response. The decision-making process can range from informal and ad hoc to tightly managed.

### ***Role of data in decision-making.***

As is clear by now, supporting decision-making is only one of the roles that data plays in the management of the district. "The first piece is it doesn't have to be about - it's the questioning piece, it's the awareness piece, it's the learning piece that comes when looking at data. It's not always about making decisions" (B. David). Many Superintendents do, however, consider support of decision-making to be a core role of data. "Certainly I think its primary use is in decision-making and I'm using decision-making in a very broad context" (T. Effron). Superintendent Cochran described a range of decisions that were supported by data. "We try to use it to inform decisions, basically. Decisions in a variety of areas. Decisions around, oh, all the things we talked about, educational issues, budget, staffing, all those kinds of things."

There were definite and differing views about the degree to which data should influence the decision. None of the Superintendents applied the term "data-driven" to their decision-making activities. Superintendent Elo characterized "data-driven" decision-making as a substitution for the responsibilities of the Superintendent: "... data can't - is not ever going to be the Superintendent. I'm never going to stand up and tell somebody that we're heading in this direction because the data tells us so." He likened decision-making to taking a trip.

If you've got a meeting in Kelowna, there are all sorts of different ways to get there, some better than others. You have to decide if you want to get there quickest, if you want to see the scenery along the way, if you want to spend the least amount of money getting there, if you want to take other people with you, or you just want to go yourself. These are things that you have to decide.

But you can't turn around and say, "The goal is just to get to Kelowna." And the data tells us that this - or the roadmap tells us that this is the only way to go, or this is the best way to go.

So, I use it but I don't rely upon it. And it isn't going to make me decide where I'm going next. But that doesn't mean that I [won't] research it before I go to Kelowna, phone up the different airlines, and I'll see how much it costs to rent a car. Get all the information. But in the end, I still have to make that decision, but the data has allowed me to make what I would consider to be a knowledgeable decision.

Superintendent Elo felt it was crucial to maintain ownership of the decision, otherwise, "you are no longer the catalyst. You no longer are leading anymore." He did, however, concede that in some cases the data presented an overwhelming case for change. "But when I talk to you about the fact that for 20 - it was 25 years, we were just at the bottom, and all accounts, in Aboriginal Ed, obviously, the data alone should have been good enough."

In other districts the emphasis was clearly on ensuring that all decisions took data into account. Superintendent David said his district staff would not make decisions unless it was "premised on data we were receiving," and Superintendent Neyman stated, "We're not making any decisions about 'where to' from here, whether it's the next minute, or the next day, or the next year, whether it's a teacher, or a principal, or a board of education, whatever it is, without data."

These positions: that data would not make the decisions and that decisions would not be made without data, are not contradictory. Even the most data dedicated Superintendents recognized that judgment and context needed to be part of the decision,

and those Superintendents who either had much less exposure to the use of data in decision-making or who were cautious about the degree to which data could effectively contribute to decisions in the education system, recognized that without consulting data, decisions could become arbitrary and unfocused. All Superintendents recognized that data could improve decision-making. Superintendent Effron noted that one of the contributions data made was to help "refine" decision-making.

...think of data as information. The more information you have, the better the quality of your decision-making and that we used to make decisions, and they were well intentioned. They maybe weren't as focused as they could be. People made decisions sort of based on gut. That you, you know, you thought you were doing the right thing and the decisions tended to be quite generalized.

The use of data, the use of information, helps us to refine our decision-making. Really to help us focus on the right decisions for the right reasons to effect change in the chosen areas or for the right children. And it just really improves the quality of the decision-making process and our ability to eventually assess and evaluate what we have in place.

Superintendents who had considerable experience with data recognized that data did not always point unambiguously in the right direction. For example, Superintendent Student described a situation in which the data on student achievement told her what she should do, but another piece of data indicated that the staff was not yet ready to go there. More generally, research often supports both sides in a debate.

There's lots of decisions that get made that are purported to be data-based; or purported to be based on research, that when you really look at the research, you know, there's research on both sides. And so, you know, whether you go-another example in the school system is the whole debate about middle schools versus, you know, the school organization K to 9, K to 6, K to 7. What's right, what's best? Well you know huge, huge amounts of money were spent to create different organizations in different places. All of which were supported by some data.

Superintendent Student noted the need to retain a certain amount of scepticism and caution in assessing the story the data tells: "So maybe we use data because it's - maybe we use data to support our decisions but we choose the data we use."

She also raised concerns about the limitations of data use. She wondered if the "... nature of education, and the fact that we're working with human beings in a product that's not - there's not an end product that looks like X" precluded the kind of data-driven approach that is associated with business management.

***Data defines the problems.***

The first part of decision-making is determining what problems or issues need to be addressed. Superintendent Shainin said data should "illustrate some of the areas of strength and weakness that your kids have..." As Superintendent David notes in the following passage, the data are also *evidence* that there is a problem that must be dealt with.

They (the school principals) brought forward to their staff - here's the latest from the school from the Superintendent in the district... this is what the district wants us to do right and here are our results. And here are results compared to other schools similar schools in the school district and similar schools in the province and that created a real awareness for teachers as well - I don't think anybody figured they could duck it anymore here it is in their face.

Superintendents connected the identification of weaknesses with a plan for improvement: "So we focus in on a district level using the data, identify the weakness, get a plan, and provide resources to try and accomplish that plan" (N. Tukey).

As the data became more sophisticated and detailed so too were Superintendents better able to specify more precisely where the performance problems were.

I worked with a group of teachers once and when we looked at the data, they said “We looked at it a different way. You know we’ve been looking at averages. And we see the class average for Math, Grade Twelve Math, was 75%.” But when we looked at their completion rates, based on how many kids had started the course, it was like 40%. And they said this can’t be our data! And well I said, yeah, but it is guys [laugh]. And then we had to start looking at our practises. And one of the things they realized they were doing was discouraging lots of kids from finishing. Because the focus was on the average! And success meant having a high average (G. Student).

A couple years ago, we-when we started to really fine tune-our first-I guess, first example of this would be four years ago when we looked at-we noticed a real dip for our grade two Aboriginal boys. And it was a cohort of 32 students, and we said, this group is not going to be successful in school unless we can do something about them. They’re in grade two, so what we did was we-first of all-and of course they’re all-this is over our 15 schools in our district. Well, I should say, ten elementary schools. And so of course there’s only two or three students of that cohort in each school. So a school themselves or a classroom teacher might not recognize that the-that there was an issue there, but when you see the whole-all the grade two students, boys and girls, Aboriginal and non-Aboriginal, and you see this one cohort that so dramatically spiked. They were 20% above not meeting of any other cohort group or even as a group, as a whole (R. Gumbel).

Easier access to increasing amounts of data enabled the development of two critical characteristics of the data set. First, it supported a detailed focus on individuals, and second, it increasingly allowed tracking of changes over time. Schools were now able to start seeing “... that it’s one kid who travels in a journey in our school district not a series of groups of kids that cycle through a grade every year” (A. Nightingale). This led some districts to start analysing the data to see if they could identify individuals who were “at risk” and intervene before their problems has become entrenched.

When we’re sitting back and trying to define through attendance which units we should be monitoring, we’re looking for predictors that will tell us. Now, what we have to do is somehow put this in with Grade 4 with [name of assessment omitted] results, and then Grade 4 FSA results, and then say, “Go watch this kid like a hawk all the way through.” He should be asterisked no differently than what we do for students with special needs because he probably doesn’t have a much greater chance of succeeding than a child with a severe learning disability, probably has less of a chance as a

child with a severe learning disability who has been to a psychometrician as we know all about them. We get funding for them (E. Elo).

Superintendent Effron described how data was used to improve the graduation rate. Although it is very clear that data was a key factor in determining there was a problem, and in supporting the conclusion that the intervention was working, there is no reference to use of data in choosing the intervention.

I'll give you a couple of really specific examples. In our district, we had really focused on increasing the grad rate for a number of years and we were stuck just below the provincial average, 76 percent. We went, I think, five years in a row, plateaued, 76 percent. Very much like the province and we started thinking, gee we're a bunch of reasonably good people, trying awfully hard. Why are we not making a difference? Like, if this has been our focus for that long, why are things not changing?

So we started trying to gather data and we started to look at the problem in much more detail and what we discovered was, that a large number of our students who did not graduate, were in fact still in the system. That the assumption was kind of well, the kids that don't graduate are the kids that have quit school along the way. They've dropped out or whatever the case may be.

What we found, that that assumption, to some degree, was wrong. That a lot of the kids that weren't graduating, were still in school right through to the end of grade twelve. But they were coming up a course short, or a number of credits short, etcetera. And we often didn't know that until August. Or maybe they were in danger during the year and so on.

So we used that information and really focused our efforts on that group of students and took people in grade eleven and grade twelve and said, "You are in danger of not graduating because of number of courses, etcetera." We've done that in a generalized way, but we really targeted them and in one year our grad rate went from 76 to 82.5 and I think we'll go higher.

So there's a real specific example of having a problem that we were trying to address and in all good faith, but not making any progress. We used data, we used information to focus our attention and very quickly were able to make a gain and I think that's really important. I think without that data, without that information, we would have been, say continuing with our good intentions, but not necessarily changing anything.



### ***Following up.***

An important last step in decision-making is to determine whether a program or intervention has had an impact on the identified weakness. This kind of follow-up, while still not typical of district staff behaviour, is becoming more frequent as district staffs gain experience and skill in using data. "We need to find out whether or not our programs are working. Not whether or not you're teaching them but whether or not the programs are working" (O. Benjamin).

When district staff are fully convinced of the efficacy of using data as an integral part of the decision-making process, following up on interventions becomes part of the operating norms for everyone, including teachers.

We have teachers that I have developing curriculum for integrating Aboriginal material into the regular curriculum at all levels, the middle, elementary and secondary level. And they said, "we want to present this at the professional day in October, but we want to follow-up a month later, and ask every single teacher that attended, how are you using it, and if you need some help, how can we help you?" (R. Gumbel).

### ***Limits of data use in decision-making.***

While Superintendents used the data to determine areas of weakness or individual students at risk, and some Superintendents used data to determine whether interventions were effective, few Superintendents used data or data-based research to design, find, or select the interventions that would be used in response to an identified problem. It was not clear on what basis the interventions were chosen, but there appeared to be a kind of "throw it against the wall and see if it sticks" approach.

(we used) everything from going directly to the band and setting up different programs with the band - hiring different support staff who work in the classroom - looking at a variety of different reading programs, different math programs - going out and hiring people at the district level to

train teachers to use different instructional strategies immediately rather than waiting. We did extensive in-service on all our kindergarten teachers and aides - all support staff, kindergarten grade 1 grade 2 and grade 3. Over a five-year period and we put a pile of dough into that so we base that all on the kindergarten assessment. It took about - it's still underway they're still working with grade 3 teachers up there now and they're cycling back to kindergarten teachers... making the budget decisions around that (B. David).

Superintendent Cochran talked about "lots, lots of changes." This included "whole schools that have altered scheduling" and "school-wide literacy blocks in all of our elementary schools." None of these approaches appeared to be supported by evidence. Superintendent Barnard described her approach to intervening as "trimming or tweaking how we go about our instruction." Again, there was no explicit link drawn to using evidence as the basis for the "trimming or tweaking."

### **When Data are Not Used**

When district staff cannot or do not use data, what guides their decisions and actions? The common answer is hunches, gut feelings or intuition.

I think it looks like using your gut you know I mean it's using your best hunch... you have a sense of what the state of affairs is or what the information is and then you act on a hunch (A. Nightingale).

I came from the perspective that our profession doesn't much like data, doesn't really care for scientific methods, really likes to do things, the way we like to do things because it seems like the right thing to do. We don't really kind of want to talk about effectiveness, or whether or not we're doing the right thing. And we're willing to commit millions, billions on kind of it-feels-good level (C. Pearson).

You know, I guess if you're not doing data-based decision-making, you're saying, "Well I've heard this. This sounds neat. Let's try that." I mean I think to some extent educators have been like that, you know. We'll try whatever comes along because we're desperately looking for something that will work better (G. Student).

One Superintendent described acting by hunches and feelings as "flying by the seat of their pants" and associated this approach with a kind of "fog and vagueness" (D.

Fisher). The sense of vagueness was echoed by comments that the lack of data prevented people from being "as focused as they could be" And that without data "we didn't know where our starting point is" (E. Elo). Without data, Superintendents would be unable to organize their districts or be systematic about obtaining success.

I think if you're not attuned - if you're not attuned to that, [data] then how do you know where to put your energies and your efforts? So I think it's kind of like drifting on a sea without a current and without a wind. That's what it looks like without using data well (D. Fisher).

So, where people aren't using data at all, or in a way that's consistent and coherent, the successes that are being experienced are more-are more dependent upon the individuals, the adults with whom you, that encounter along the way than on the system being well organized for success (F. Neyman).

### **Barriers to Data Use**

All Superintendents felt that their districts had faced, and many still face, significant barriers to the robust use of data in improving student achievement. The barriers fall into two categories: *structural* and *cultural/political*. Structural barriers involve data availability, the time and effort needed to use the data, and the level of competence of staff in the various modes of data use. Structural barriers are, in a sense, barriers of resourcing.

Cultural/political barriers are the attitudes, beliefs and ideologies that oppose the widespread use of data in the school system. These barriers provide a foundation for political actions designed to undermine the use of achievement data in schools. The cultural/political barriers interact to create an environment of *resistance* to data use.

### **Structural barriers.**

The structural barriers Superintendents described most often were data deficiencies, the absence of the appropriate technology to manage data, and staffs that are not prepared to use the data.

### ***Data deficiencies.***

The lack of data is of course an obvious barrier. No Superintendents were currently without data, but several noted that when they first assumed the role of Superintendent there was little data available (A. Nightingale, M. Smith, H. Barnard). The major problems now were either gaps in the data and or the quality of the data. Superintendent David wanted more data on Aboriginal students who had been enrolled in band schools<sup>30</sup> and Superintendent Cochran noted that while his district had good data about student literacy, the district was without numeracy data. For Superintendent Neyman the gap was in the absence of “local high quality, rich, thick and deep assessment instrument [evidence].” A number of Superintendents noted that their challenge was to obtain data that was reliable (H. Barnard, B. David, G. Student, L. Anscombe, N. Tukey, P. Gosset, Q. Box), consistent (P. Gosset), rich (D. Fisher), and credible (A. Nightingale). Once Superintendents had access to a sufficient store of high-quality data they turned to the challenge of obtaining data that was more powerful, more predictive and more useful in being able to improve student outcomes.

I haven't seen the data that we can sit back and put an asterisk next to the child and say given his home, where he lives, how much his parents - I don't know all the facts that you would put into it, but given all those

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<sup>30</sup> Band schools provide education to Aboriginal students. They are run by local Aboriginal Bands and funded by the Federal Government.

factors, there's a 70 per cent chance that if we don't pull an intervention, we're going to lose him (E. Elo).

### *Administrative Overhead.*

Collecting or gathering the data are only the first step towards using data. It must also be understandable, easy to use, and not require too great a time commitment: it must be 'user friendly'. The core concern was the time needed to work with data.

Superintendent Neyman spoke of "administrator overhead."

There's an administrative overhead that has actually become an administrator overhead because it's the administrators who tend to take this on. I tell them they should, and they know they should... be taking the lead... in any given school, there's a vice-principal probably, who is busy pulling all of the data together, whether it's Provincial data, or school-based, classroom-based data, and trying to organize it, and make sense of it with support from us in the district. But it's taking a lot of time.

Superintendent David suggested that the data need to become easier for principals to work with so that it would take less time.

I think we need to again make it easier to use - less time consuming for principals to... represent it in easily understood ways. I think there's lots of information there. We were looking at cohort groups... and I have lots of principals tell me how much time they were spending and it kind of shocked me - how much time they were putting into that so, I wanted to make that easier for them

The need to insure that the data was easily understood was a challenge echoed by many of the Superintendents. "...just help put that [data] in some kind of sensible manner and make it easy to digest" (A. Nightingale).

### ***Technostructure.***

In any district with more than a few hundred students to make data user-friendly requires a robust technostructure,<sup>31</sup> the absence of which constitutes a considerable barrier to data use. The technostructure in school districts is comprised of the technology to store data about student performance, to connect the performance to other variables, to easily retrieve the data, and to organize it to support analysis and planning for all levels of the organization. The technostructure also includes data experts who are engaged to help administrators and teachers understand the data and connect it to teaching practises.

I think that every level of the organization absolutely requires a person to use information and data in order to be able to understand their job and understand of the actions that need to be taken and you simply cannot function without good information. I'm not sure that we in our business figured out a way to provide every level of the organization with the information and a climate in which to enable people to use that information in a way that's can result in the best actions... We don't have the infrastructure in place to support the questions they're asking (G. Student).

### ***Preparedness.***

Perhaps the most challenging of the structural barriers is the need for staff at all levels to have the training and knowledge to use data effectively. Superintendent Barnard concluded that if staff is not properly prepared, data becomes a problem. "I think if you don't teach people how to talk about it, and how to digest it so that they can make some kind of local sense out of it, then data just ends up being a problem rather than a solution or help with the solution."

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<sup>31</sup> This is Henry Mintzberg's term for the analysts who support the work of those who are responsible for creating a product or delivery service (Mintzberg, 1979). I am borrowing and expanding it to include not just the analysts, but the tools that support the teachers and their administrators. The technostructure encompasses the technology used to store the data, and the technology used to make it understandable and easy to analyze for a variety of staff, who have differing levels of expertise, content interests, and functions within the school.

Superintendent Gosset acknowledged that generally educators are not well prepared to use data.

But if you get past the willingness, then you get to the technical collection, and then you get to the interpretation phase. And there's not much training or pre-history. So, interpretation tends to be naïve, I guess, or unsophisticated, or something, because people in the education realm just don't have any background or training in this.

Superintendent Student noted that while her district had a "wealth of data to work with..." it was necessary to find the "skilled people who can find out of the data what you want." Superintendent Fisher found that as the data agenda moved forward the whole administrative staff had to become "really assessment literate." Superintendents Pearson and Nightingale felt that the problem of being prepared extended to the superintendency itself

Well, my personal think-feeling is that they ought to be experts at being able to examine pieces of data, and make any sense out of it. And my personal observation is that I have not seen anybody do it. And I've done seven District reviews where piles of Ministry data are provided to - and it's to take a look at. And, in my observation, I see gross denial of the data (C. Pearson).

I'm not sure that anybody is very well-trained in the superintendency I'm not sure we've been given the training and the tools to really understand the use of data and information and so I think that there's an assumption that people should know how to do that and I think that in lots of cases people don't want to admit what they don't know. I think it's rife within our sector that we don't really have those really good tools and so it's kind of hit and miss (A. Nightingale).

To Superintendent Galten the core problem was that the "learning agenda for the adults is missing."

There are tons of conferences. There are tons of material. But I think we get stuck with just very similarly to how we would say the average district plan, and in true confessions, mine included, there'll be a shotgun of strategies we're using in literacy, numeracy and social responsibility without any really true accountability to know whether, at the end of the day, we really are absolutely making a difference for children.

The structural barriers emerge at different points in the districts' trajectory of data use. At the beginning of the trajectory, the salient problem is lack of data. As data are found or generated, the concerns turn to ensuring that the data are complete, and of high quality. The data sets grow, eventually becoming unwieldy and difficult to manage. They demand too much time of administrators and even teachers. A technostructure must be developed to help manage the data. The preparedness of Superintendents, district and school administrators, and teachers determine what forms the technostructure will take at what times. Initially the focus is on the technology of assessment - developing or acquiring the assessment instruments that generate the data. As the data sets build and district staff become more competent in analysing data, the technostructure must provide tools to support analysis, or even staff experts to help the educators connect complex sets of data to educational practise. The preparedness of the educators drives the need for more sophisticated technostructure, and the increasing sophistication of the technostructure increases the capacity of Superintendents to prepare staff for deeper engagement with the data.

### **Cultural/ Political barriers of resistance.**

And we went to a department head meeting, and George was a pretty skookum guy around data and evidence and so on and very good with computers and graphics and so on. So he did a presentation at the department head meeting which was a thoughtful analysis of the provincial exam results. We barely escaped with our lives. And I wasn't concerned how fast I could run. I just wanted to make sure I was faster than George. Because they were going to kill someone, and he was the natural choice because he had come in full of piss and vinegar, saying, "Look at this evidence. Look at this data, which should be a powerful motivator for us to discuss and engage in the key work that we should be doing (V. Shanin).



Cultural/political barriers are the attitudes, beliefs and ideologies that are the root of opposition to widespread use of data in the school system. These barriers provide a foundation for political actions designed to undermine the use of achievement data in schools. The cultural/political barriers interact to create an environment of *resistance* to data use.

Resistance is the conscious, active, opposition to data use. When resistance is organized, it becomes political. Resistance involves the interaction of mindset, autonomy, fear, and political opposition. These conditions tend to be mutually reinforcing and hence can be a strong barrier to data use. A mindset that opposes data use is given professional sanction by the concept of autonomy. Such a mindset could be strongly reinforced by fear that the data might in some way be used against an individual. Groups opposed to data use can exploit the mindset/autonomy/fear construct to organize, spread and deepen resistance to data use. Superintendent Gosset described how mindset, autonomy, fear, and political opposition interact to form a powerful barrier to using data.

Well, I think when people feel vulnerable, or exposed, or they've been painted by the adversarial culture that exists at the Provincial level, they can retreat inside a self-defensive shell, which is virtually impossible to penetrate with logic, and given professional autonomy, and the underlying complexity of-of the educational process, and the very convoluted relationship between instruction, and learning, and student attributes, and social context, and school context, and so on, if people aren't prepared to have the conversation because they're fearful, then all the rest of the stuff isn't going to take you anywhere. So, that's the first barrier.

### ***Mindset.***

When George made his presentation to the department heads, he was facing a mindset about data use that is deeply established in the teaching profession.

Superintendent Shainin pointed out that people who choose to enter education are

choosing not to be “auditors or scientists or Revenue Canada staff or people who worked with what might be described as absolutes. They came into the business because of some attention to the social sciences and to the greater good and the contribution.”

Superintendent Pearson noted that data was in conflict with how educators see people. “Data quantifies people and, therefore, defines them. And that is all that is bad in public education.” As well, data tends to be used by the people that educators “mistrust of the most”, such as the Fraser Institute. Data are also a very powerful way of pointing out deficiencies; “there’s no such thing as good data; that data will reveal that we’re not doing as well as we’d like (C. Pearson).” Superintendent Barnard commented that data can be quite upsetting to educators who are working hard and making their best efforts for students. “... it was pretty horrifying to hear that after all the efforts that they had been putting in, things weren’t going that well. It’s a hard message.” Data can also sometimes appear to be a waste of time because the results, especially of longer-term programs, do not appear immediately and therefore are not seen to be connected to the work teachers are doing.

Our business revolves so slowly, and evolves even slower so that it is really hard to make a connection between an action taken in year A, and outcomes that are revealed in year B. And because the cause and effect is so poorly defined, and poorly articulated, and so many pieces change along the way, and so many personnel have changed along the way, that keeping track of action, based on data in one year is a lost art (C. Pearson).

Use of student achievement data presupposes that a core goal is to increase student achievement. Superintendent Shainin suggested that for many teachers success may in fact be measured quite differently than how well students are performing.

And I think that the ideology, the softness, the autonomy that teachers have, the indicators of success. Success means I'm tired at the end of the day, the kids appear to be happy, there's no parent fuss except from unreasonable

parents-the only kind who would fuss-and my principal's off my back. And we've got a system where we're being evaluated once every three to five years. It's relatively meaningless. As long as I remain fully clothed and upright in the classroom, it's pretty unlikely that I'm going to be drummed out of the business.

The mindset that opposes data use can also be rooted in entrenched habits and routines. "...people don't want to do diagnostics because, "I know what I'm doing, thank you very much. I've been teaching for 20 years. Why would I want to use the Jerry Johns<sup>32</sup> or SmartReading<sup>33</sup> or whatever to find - I know this stuff. Leave me alone"" (J. Cox).

### ***Autonomy.***

Autonomy is widely regarded by educators as an important dimension of their professional practise. Autonomy has two aspects; first the individual teacher should be relatively free to choose the methods of educating students, and second the teacher should be able to implement these methods without being subject to oversight or transparency. In effect, autonomy has come for some teachers to mean teaching in a closed, isolated environment (Glickman, 1993).

...even today, there are lots of places where teachers are completely autonomous in their classroom and they are accountable to no one, other than you know, to some extent, their principal. But you know classroom doors traditionally have been shut. Teachers have been given free rein to do whatever they want in their classroom. And the expression in the field is you know, "let me go in my room and shut the door where no one will bother me" (G. Student).

Clearly a teacher whose mind set is disinclined to use data will find that autonomy provides an excellent rationale to avoid opening up his or her classroom to the kind of

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<sup>32</sup> Jerry Johns *Basic Reading Inventory*. Pre-Primer through Grade Twelve and Early Literacy Assessments.

<sup>33</sup> *SmartReading* is a component of learning approach developed by New Westminster School district designed to incorporate all of the research-proven literacy practises to date.

transparency that data use can create. The kind of autonomy that isolates and insulates teachers from the outside world (and perhaps outside judgment) is increasingly hard to maintain. Superintendent Galten suggested that even though mindset and autonomy are powerful barriers, the door to the classroom can no longer remain shut. If teachers want to have control over instruction they need paradoxically to relinquish their old notion of autonomy.

...the problem is that you can't stop the diversity, and you can't stop the door from opening, and another kid coming, or another challenge coming. And it's a really hard place for people to get in their mindset that the way to deal with having the most control over the instruction in their classroom is actually to relinquish control of the learning process to the child and the teacher in a-in a different role and context than is traditionally felt. And so I think that's a big barrier.

***Fear.***

All Superintendents mentioned at one point or another that fear was a barrier to being able to use data.

I think that probably the number one barrier is fear, and I would say fear of a few things-fear of loss of control, fear of that I'm not doing okay, right-fear of the unknown. And I don't mean it in that I'm terrified but just people really want to know that they're competent in their work, and people feel competent in their work. And when they get into the evidence, and really examine their practise, you might find some things that really you realize aren't working, and that's a hard place to go (U. Galten).

Fear took several forms. Superintendents commonly reported that a major source of fear was simply to be found by others as wanting, looking bad, or not "measuring up" (C. Pearson).

In our district, huge suspicion that we are using this for the forces of evil and not good. Truly. "You're doing this to make us look bad." I wish we could be way more honest about data (J. Cox).

Because I think that's ultimately what's at the bottom about any fear about data are that, "I'm going to be compared to someone else and found to be wanting (H. Barnard).

Superintendents recognized the fear of teachers that data will be used to evaluate them, if they are found inadequate, would lead to specific actions being taken against them.

...they're afraid they're going to be singled out... they're afraid that they're that data use is going to be plastered up on the wall, and are they going to be ranked, or it's going to make a difference whether or not they get a transfer to another school (J. Cox).

Teachers also fear that if they do embrace the use of data they will be ostracized by their peers or their union. "... the teachers say, "you know what, I don't-I fully endorse what we're doing. I have no problem with it, but my union is putting so much pressure on me, I don't want to be blackballed or whatever"" (R. Gumbel).

### *Political resistance.*

Mindset, autonomy, and fear would be less pervasive if they were not sources of support for an ongoing campaign of the British Columbia Teachers Federation (BCTF) to restrict data use. About half the Superintendents noted that the BCTF had in various ways tried to impede data use in BC schools.

... we've got this elephant in the room where our ability to lead is being compromised by the Unions, and we're ignoring it. We're absolutely ignoring it. And if somebody thinks that by sending out information on FSA and somehow that's going to change the Union's mind, it's not. It's not even being read. It's being read by those people who already are going to do it, like principals and administrators and things like that. So, that's the first thing they have to do. Anything that gathers information, there seems to be an inherent distrust of (E. Elo).

Superintendent Neyman connected mindset, economy, and fear to the BCTF's injunction to members not to engage in district-wide assessments.

And I think the two things that keep us from being [okay] with teachers are their concerns that they're going to be judged-three things really-their concerns that they're going to be judged, which they won't be, but how do we convince them of that? They're being told by the Union to be nervous about this, and to - and to stand down from anything that has to do with planning, and their professional concerns about autonomy, which are quite legitimate, right, those who are saying-there might even be those who are saying, "I don't care what my Union says," and "I don't care if you need my data for planning. Go ahead. But it won't be what you want me to do because I have autonomy. I'll give you whatever evidence you want from my assessments but it won't be DART, and you can't make me because I am an autonomous professional.

Superintendent Pearson, while acknowledging the role of the BCTF in making data-gathering difficult, noted that conflict with the union may upset what he called the "happiness quotient". This is the state in which the district staff is able to work with the local teachers association while avoiding direct challenges to the BCTF.

Now, in the environment that we live in, there's something to be said for the happiness quotient, because we were a pretty happy District. For the eleven years I was there, man, we did - we did business with the Teachers' Association that was all over the place, and had nothing to do with the official - the BCTF line. And everybody was-they were happy. They were-they were pretty excited about the way things went (C. Pearson).

A number of Superintendents noted that they had good relationships with the local unions but the BCTF "mandate about any form of data and its use" (O. Benjamin) was a major source of difficulty in the effective use of data to improve student achievement.

## **Supporting Data Use**

### **Leadership.**

Superintendents see that their role includes supporting data use in the district. They use a complex web of strategies to support data use. A single strategy may support several others and many of the strategies mutually reinforce each other. Central to the web are mutually reinforcing processes of developing or strengthening an organizational

culture<sup>34</sup> which embraces data use, engaging staff, and ensuring the data are organized to effectively support its use.

### **Organizational culture.**

I am describing ‘culture’ as the deeply held expectations, assumptions, and attitudes of staff in the organization. These expectations are a product of the organization's history, training and history of its members, current political context, and the leadership capacities of the district Superintendent. Cultural patterns are “highly enduring, have powerful impacts on performance, and shape the ways people think, act, and feel” (Deal & Peterson, 1999, p 4.). A culture which supports and encourages the use of data will be quick to embrace the engagement and organizational support necessary to make effective use of data in improving student achievement. A culture that fears and opposes data use will be a difficult environment in which to organize data or engage staff in its use.

Superintendent Pearson described what the environment looks like when the culture has begun to embrace data use

They [principals] begin to describe their environment in a different way, that “We’ve got a handle on all of our kids,” or “98 percent of our kids,” or whatever it happens to be, and they can say, “And we’re planning something that will make a difference for these kids,” rather than, “Yeah, it’s a great school for everybody who enjoys it there, and we’re having lots of success.” I want that, but I want the other-the second part, the deeper part as well. And I’d like to-and a sign of that, for me, is that people wouldn’t let you get away with just, “Ah, yeah, I hear it’s a good school,” or “I hear it’s just a bad school,” or “Hear blah-blah-blah.” You know, they’d be able to speak in more specific terms.

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<sup>34</sup> I debated whether a better expression might be “Creating an Environment ”as Superintendents used both the terms ‘culture’ and ‘environment’ to refer to the general situation in which data use takes place. In the end I felt that the word ‘culture’ better emphasized the underlying historical, social, and political context.

Superintendent Neyman suggested that the challenge was to "create the environment within which we can naturally collect that data [student achievement] so that we can intelligently use it." If the Superintendent is successful in establishing such an environment there will be a high level of consistency and alignment between the expectations of outcomes and the experiences of staff.

But if you - if you are in an evidence-rich environment that has the right- there's data being used wisely, then you'll have a consistency of experience, a consistency of outcome, a consistency of quality of experience, even though the actual experiences may differ from place to place, if it's all high quality, it's all properly assessed, it's all well planned, and everybody gets the same sort of quality of experience even if they differ slightly in the way that they're delivered (F Neyman).

Superintendent Cox described a "cultural shift" in which administrators and teachers realize that "data are information that guides practise, and we shouldn't be afraid of the truth." Superintendent Box saw the cultural shift as moving towards a professional learning environment.

But for me, the deeper and most sort of enduring affect, is to create the kind of professional learning and therefore data appreciating, utilizing culture that I've described to you. And that's setting out to determine, in a very positive way, a non-combative way, what it is about data practises and measurement, etc., that people would say is most positive and is most desirable

This shift would be deeply embedded into the culture of the organization and would perpetuate itself.

And that would be almost a generational thing that the district would set out to do. In other words, create a full generation of workforce, and I'm not just talking teacher workforce, I'm talking multiple roles workforce... It's a way of being. And so that generates and regenerates itself in terms of how people pass on their practise formally and informally to others (Q. Box).

For Superintendent Student a key step in shifting the culture is moving from an environment of isolation into one of engagement.



What I hear in some of the conversations in our [indiscernible] when I hear, you know, transparency, and having people start to discuss or you try moving out of isolation into a kind of environment of question and inquiry, underlying that is some notion that once that happens decisions will start to be made on a basis of more data and more information as opposed to say our habit [against] our whim.

Superintendent Student noted that if data are to be used properly it needs to be seen as nuanced and understood in context of discussion.

I think that you know it's, I think people need to see the power of data. And they need to see data as being broader than just a set of numbers, you know. A lot of it is about building a culture that is based on-I guess the scientific world has done data some disservices because people seem to think that data are black and white. And it really isn't. In fact it's very grey. And that's, that's a mindset that has to be shifted. And doing that is about conversation, it's about education. It's about constantly going back and, you know, pounding it home. You know, it's just teaching.

### *Trust.*

A core element of the culture that enables the engagement of staff is trust, especially that the data will not be used in the wrong way. "I think people have to trust that data's going to be used for the right reasons (Superintendent Cox). Superintendent Gosset felt that trust was the beginning point to take on other barriers. "If you can establish some confidence, and some curiosity, and some trust, then, I think, you get inside all of the-the barriers that are more technical..." A Superintendent new to her district indicated that one of her first challenges was to inculcate a sense of trust about the data.

I'm wondering about the-I think we needed to have developed some trust around the District to allow us to talk about this. That was the other thing. Because our results are not to be going around bragging about. So, it's a really careful conversation that you have to be having so that people recognize that they don't-that they can talk about it, and they don't have to feel defensive, and they don't lose hope in doing their work. Trust was a pretty important part of that (H. Barnard).

Another Superintendent who came into a district where data had been integrated into their culture for many years noted: "... there has to be a foundation of trust. If there's not a good working relationship between all the people involved, then it won't work. So if you're going to bring data in, there has to be both a real and a perceived trust among all of the groups that it will be used for the right reasons." Superintendent Elo commented, "if you've got a lot of trust in the room, you can get into some really good discussions."

Underlying the injunction to use the data for the "right reasons" is a prevailing fear of staff that data will be used against them. Superintendent Shainin described the fear teachers in his district had about the implementation of a particular assessment. "If you use RAD<sup>35</sup>, the district will roll this up. It will be used in your evaluations. Someone will come and whack you. It's being used to compare schools and to embarrass. It's No Child Left Behind." Assurances by the Superintendents and administrators that data will not be used against them will only be effective if the leaders are trusted. "So, there are things that we can do to eliminate the concern [about data], one of which is for the individual who's saying, "I'm not sure if this will be used against me." We just say, "It won't be. And we'll make it so that it can't be"" (F. Neyman). Superintendent Elo noted somewhat less reassuringly, "Please don't flatter yourself to think this is about you as a teacher. It isn't. If we need to judge you, well, we have lots of ways of judging you. If you're afraid of being judged by this data, don't worry about it. We're judging you in other ways." And from Superintendent Cox: "one of the challenges is we don't want people to think we're using it to find out who's the worst teacher, who's the worst school, or-it's about ranking. It's about being able to support one another, and establishing that culture of

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<sup>35</sup> Reading Assessment District. An assessment is done at the beginning and end of each grade.

trust-open doors in the schoolroom.” There is little room for failure; “... the first time that you use it for the wrong reasons, it will go off the rails” (T. Effron).

A key element in developing trust is to ensure that implementing data use is done openly and transparently.

So for me it was pretty simple. I wanted people to understand why we’re doing what we’re doing. When I would go to the Superintendent as a principal, I couldn’t get a straight answer and couldn’t figure it out, and that led to that nagging doubt, I’m getting screwed here somewhere, or my school, my kids, right, or something is happening here that it’s not fair. It’s not equitable. Maybe it is or it isn’t, or it was or it wasn’t, but I couldn’t tell. I couldn’t know that for sure. And I think now my principals would say, oh, yeah, maybe they don’t agree, “but I understand why, and I get the big picture, and I can explain (I. Cochran).

### **Engagement.**

The engagement of staff in the use of data is both a strategy for changing the culture and an outcome of aligning the culture to data use. Although cultural change, in the sense of developing a sense of trust and integrity, needs to either begin or be in place in order to support engagement, the engagement of staff is a means of reinforcing the culture and of creating momentum for further acceptance of the use of data in the organization. For Superintendents the concepts of engagement and ownership are used interchangeably.

Engagement, as Superintendents Yates and Gumbel pointed out, must be system wide.

So that, to me that’s what ownership is. Is it’s a really system-wide ownership. The greater extent you can develop a system-wide ownership, the greater extent you’ll be able to sustain this work. And so it doesn’t move on after, you know, one or two champions move on or whatever (K. Yates).

And whether my name has a Superintendent in front of the title, or if I’m a teacher or a bus driver, I’m all part of the system. And how do we engage

everybody so that, you know, the bus driver realizes that's the first entry point in our system every day for a lot of our kids, and if they're in a grumpy mood, it's going to affect that whole busload of kids, and that's going to affect the teaching level for those kids. Or the secretary, meeting parents. You know, those kind of pieces [are the climates] of our schools. You know, those-all-everything's interconnected, and I think when you get into a class and you meet people-like, I like to meet every, single employee in the first month and a half on this job, and I did that (R. Gumbel).

The interconnections that Superintendent Gumbel speaks about are fashioned through the invitation of the leader to people to have meaningful input into the conversation.

So if you want teachers to buy in, you want administrators to buy in, parents to buy in etc, you have to be willing to invite them into the conversation. And you have to be willing to compromise in your decisions, to take - you know, to I guess, you know, reflect their wishes... So if you invite them in and you don't accept their input, it won't last very long. And so it-people have to be willing to compromise and respect the different opinions and in the end, it's that trust and that buy in that allows it to be successful and move forward (T. Effron).

Superintendent Neyman tied engagement into having a common conceptual framework for everyone in the district.

So, that conceptual framework that I really need us to have is that first of all, we have teachers, administrators, parents, kids, everybody then gets the notion of the importance of commonly administered high quality assessments to support teaching and learning, and that-and that they're useful for everything including in-the-moment decisions, plus going-forward decisions. And what they - what I need from that is the extension into-and we're okay with our having captured that assessment data in the classroom, knowing it's consistent with our neighboring classrooms, being collated for school and district planning purposes. That's the framework that we need and that's what makes data useful for us.

Superintendent Cochran distinguished between simply presenting "a bunch of tables and graphs" and "developing that knowledge or that information together." When the knowledge is developed together it becomes "common information" and is not seen as simply an effort of persuasion. Superintendent Gumbel looked at engagement in terms of breaking down isolation. "And so you have this situation where you have this person

you really respected or maybe feared, and now you're working as a colleague alongside them. And all of a sudden, that is -that wall is broken down, too, for those people.”

Many of the Superintendents described engagement in terms of teachers and principals looking at student achievement over time and not just on grades in a given year.

What they're trying to do is create some ownership for their grade 7 teachers that says you know, or they don't know. But like the question we asked is, is it, is there something that's not happening in grade 7? Or have we got kids coming in at a bunch of different, like you know, are the kids coming from (school name) doing much better on the grade 7 FSA than the kids coming in from here - we've got coming in with different base skills. Do we know that? (G. Student)

Superintendents were aware that to engage teachers in data they needed to demonstrate that it was of value to them in the classroom.

Yeah, that's - I think that's what it's been for our teachers. It hasn't been this Big Brother checking up on me kind of program. It's “how can you help me in my classroom?” And that's-you know, you're going back to the buy-in from teachers. You know, it's like anything. Like any tool that people are going to see use-as useful for their own personal use, as well as, you know, okay, also have this secondary, to them, district use. And quite frankly, it should be secondary to them, district use. They shouldn't be focusing on our district achievement because every piece counts towards that.

When the teachers saw the primary reading intervention, we said, that's a result of our data collection. They said, “Oh.” They're making the connecting with here's the infrastructure piece that was built on the fact that we saw that need, and it's not about you teacher X not doing your job, although we have those conversations. But it's not because of the data material. It's about what we do as a system to support our kids, and we share that with everybody. We say, here's what it shows us (R. Gumbel).

Superintendent Cochran related how a data set that was not of use to teachers became a mere formality.

So we've gone from that, where people just sort of slowly stopped using it. But they were doing it because they had to report the results to us, to the district level, and they'd fill in the boxes. So data then was dirty. It was a

dirty word. It was work you had to do for somebody else and god knows why. Too, as we cycled out of that into a much more around student achievement data, much more school based, we don't want anything in the accountability contract or the achievement contract now if we can avoid it that isn't used by teachers in that school to inform decisions (I. Cochran).

Engaging teachers requires time, consistent effort, and diligence about using every opportunity to demonstrate to them the value of the data. "... whenever you're sort of having a debate, a discussion, you have to bring it back to what's happening in the classroom, to what's happening with the kids. And you have to make everybody feel that they are a part of that" (G. Student).

Superintendents appeared to follow a pattern in how they attempted to engage their staff. They began with district administrators - ensuring that they were capable of understanding and supporting data use. Superintendent Fisher wanted to make sure that the administrators had a deep understanding of the data and could see that there was a plan for how data would be supported.

...we started as a district staff and lots of time went into that lots of review and analysis of the data we already had sitting there and we built a plant with district staff first... We all made sure that we examined and worked with the data; worked closely with our administrators; we brought resource people into help us and they learn to work with data. But I think that's what made things much more complex but much more rewarding in the end. Is that we really were all on the same track about what was important and what we had to do to get there.

After preparing district administrators to use data, the Superintendents, were able to build understanding and support with their principals. Superintendent Tukey recounted conversations at the district and then school level management. "The biggest data conversations occur, say, with the Director of Instruction and me and/or with a one-to-one conversation with principals". The engagement of district and school level

administrators laid the groundwork for drawing teachers into the conversation about data use.

Although the sequence for engagement went from Superintendents to administrators, administrators to principals, and principals to teachers, the Superintendent remained deeply and directly involved in ensuring that each that the engagement process was strongly supported at each level.

***Being prepared to use data.***

The goal is to engage as many staff as possible at all levels of the organization. “Where you're putting data, the ability to use information, easily and effectively and in real time, into the hands of a whole bunch of people. That's where the big differences are going to be” (T. Effron). In order for staff to be engaged they must be properly prepared. Staff who lack knowledge can be “overwhelmed and under-skilled” (V. Shainin). Superintendent Barnard observed that without proper preparation the data conversation can actually make things worse. “I think if you don't teach people how to talk about it, and how to digest it so that they can make some kind of local sense out of it, then data just ends up being a problem rather than a solution or help with the solution.” Superintendent Pearson considered preparation for data use to be part of understanding the science of education.

You know, it's just like we - to me, we spent a whole bunch of years trying to be more scientific about education. And the purpose of faculties of education is not just to train teachers, but it's also to talk about the quasi aspect of the science of our business. And unless we can inject hopes there'll be more science in terms of going after data points and then analyzing those data points, and making changes based on it, we're just kind of fooling ourselves.

Superintendent Fisher felt that the “best piece of advice” he could give someone asking about supporting data use was to:

...make sure that you really create an environment in which people could learn how to work with the stuff and provide the resources to do it. And don't assume that because you spent two ardent years at it you're there. You have to keep redoing it and redoing it, involving more people; and getting the people who learned to help others. It's always a work in progress. And it's like there can never be enough communication. It's, there can never be enough learning all this stuff. You have to keep it alive.

Superintendent Fisher insisted that his administrative staff be well prepared to use data.

He preferred to recruit personnel who already had the skills to support data use, but for those who didn't he instituted a program of professional development: “you need to either have that skill, or you have to be committed to learning that skill, because you can't operate without it.”

Although many of the Superintendents noted that the initial challenge was to develop the capacities of district and school administrators, the longer-term goal was to extend the capacity to all educators.

Well, basically, for us every employee that is working directly with children is either in the process of, or is quite acquainted with, the data that we're collecting. That's through a fairly deliberate but lengthy process of data literacy upgrading, I guess, if you want to call it, for all employees so that it's not just in the hands of one or two people but everybody's aware of what we're collecting, how we're collecting it, and also the tools we're using to collect it with. So as they become proficient, they can actually do analysis on their own without having to wait or send off, looking for reports on various cohorts of kids or groups of students (R. Gumbel).

Superintendent Student felt that it wasn't just educators who needed to understand data:

“It needs to be the broader context, like your parent councils and your school planning councils, need to now understand the importance of working with data in context.”



*Strategies for preparation: Hiring.*

Given a choice between hiring a principal who understood data but did not know how to manage a school, and hiring a principal who could manage a school but was not prepared to use data, Superintendent Cochran always chose the former.

We have folks that don't have a clue about how to manage a school. So we're backfilling that. Our professional development with the admin group in the five years I've been at the board office has flipped 180 degrees from, "Okay, folks, now we're going to do some stuff on data, to, "Okay, folks, here's a collective agreement. Read it. We're going to walk you through what you can and can't do." So we've gone almost to full management professional development because over that period of time, we've flipped the force. We've hired people that understand teaching and learning. They're not managers, and so we're trying to build managers (I. Cochran).

For more than a decade Superintendent David had emphasized a different set of skills for the administrators he was hiring. "...we began to hire individuals with different philosophies about leadership and instruction. That was... 10 to 12 years ago [when] we started talking about instructional leaders rather than school leader." The instructional leaders were expected to be able to connect instruction and data.

...if you didn't understand instruction per say and you didn't have some understanding of what the data was telling you from your school and you planned to become an administrator in the - school district you'd better understand that peace and you'd better not just talk the talk and you'd better walk the talk as a teacher and as a leader in your school (D.Fisher).

Superintendent Fisher also preferred to hire administrators who were already data capable but pointed out that because his was a northern district he was consistently losing administrators to southern districts. Consequently, "we had to develop our own. And we had to put them on a very enriched learning curve." Superintendent Elo, who himself was quite data capable, chose to extend that capability through his selection of his administration team. "I was able to develop my team. I surrounded myself with people... certainly, who, again, are much more excited, and are much stronger believers in

assessment, you know, in learning practises than I am.” Superintendent David said that over the last five years his district began to extend the criteria of data capacity to the hiring of teachers.

*Strategies for Preparation: Professional development.*

Although some Superintendents clearly emphasized hiring criteria as a way of ensuring that staff were prepared to use data no Superintendent indicated that this was the only way in which they built up district capacity. Pre-service academic studies in faculties of education in BC rarely involve developing strong skills in data use. Superintendent Gosset suggested that even when there is some attempt to provide some instruction in data use, the instruction is not relevant to the situations educators are actually involved in.

But if you get past the willingness, then you get to the technical collection, and then you get to the interpretation phase. And there’s not much training or pre-history. So, interpretation tends to be naïve, I guess, or unsophisticated, or something, because people in the education realm just don’t have any background or training in this. And even if they take a Masters Degree, they didn’t understand the course, and it was-it was done using non-applicable examples. So, it’s just the same as not having any training.

Superintendent Cox commented that even if the Superintendent had built up district capacity, the Superintendent couldn't "take it for granted" that capacity would remain. High levels of turnover mean that building capacity is an ongoing activity requiring professional development.

The forms of professional development that Superintendents use include conferences, webcasts, workshops, training of trainers, supplying relief time to allow teachers and principals to work together, coaching, training for positions within the district, and action research approaches that involve learning about the data by using it in

the day-to-day activities of districts staff. The general pattern outlined here is a movement from outside the work context to inside it. Conferences and workshops generally deal with principals and techniques of data that are based on examples outside of the working context of most of the participants. Coaching, training positions and action research approaches look at data use from the inside, from the work that participants are actually doing. Superintendents who are in the early stages of supporting data use tend to start with the "outside" activities and as the district capacity is developed, move further towards the "inside" activities. Superintendent Cochran described an action research oriented approach.

So our use of Inquiry, our use of action research, because you can't, teachers, and we've probably got forty action research projects going on in our district right now, with probably fifty teachers involved. Sometimes they [appear] on those questions, and they're all questions they drive. They start with a question. We offer some support to that through a variety of mechanisms. And that is teaching them the right way, I think, of, you know, we've got a question. Okay. So how are you going to know what, you know, what do you think, how are you going to know if your intervention or whatever you've tried is working? Well, you've got to collect some data. Okay. What's that data look like? Can we help them with that? It's those small conversations that are really spreading the work into-because I think those are now coming up in school conversations.

Superintendent Galten also supported research projects for all teachers and in addition established positions to allow teachers to develop a much deeper expertise in data use. The positions are rotated so that the expertise is disseminated more widely. "It's about having every teacher raise their expertise with regards to comfort with assessments, and instructional strategies, as opposed to have the one great person on staff."

*How prepared to use data is the system?*

All the Superintendents felt that it was important for themselves and their colleagues to be comfortable in using data. Most Superintendents indicated that they were

well prepared to use the data, but one of the Superintendents who admitted to needing more understanding of data noted that some of his colleagues might be overstating their capacity.

I'm not sure that anybody is very well-trained in the superintendency. I'm not sure we've been given the training and the tools to really understand the use of data and information and so I think that there's an assumption that people should know how to do that and I think that it's kind of like in lots of cases it's sort of the people don't want to admit what they don't know when people think they should know what and I think it's rife within our sector that we don't really have those really good tools and so it's kind of hit and miss (A. Nightingale).

Superintendent Neyman, who had a math background, confirmed that despite the progress many Superintendents had made in this area none of them in his opinion were sufficiently well prepared: "I don't. I don't either. None of us do. We're all learning."

Superintendent Pearson, who had been involved in many reviews of other districts over his 18 years as Superintendent, provided an even more pointed comment:

...they ought to be experts at being able to examine pieces of data, and make any sense out of it. And my personal observation is that I have not seen anybody do it. And I've done seven District reviews where piles of Ministry data are provided to-and it's to take a look at. And, in my observation, I see gross denial of the data.

Regardless of their own skill level, Superintendents generally felt that district administrators were reasonably well prepared to use data. However there was much less confidence that their principals were sufficiently well prepared (C. Pearson, S. Friedman). Superintendents generally agreed that the capacity to comfortably use data was still largely absent in teachers, and that this was an issue they were attempting to address.

## **Discussion.**

No concept was referenced more often by the Superintendents than discussion.<sup>36</sup>

Discussion was seen as a way of engaging staff in using data and over the long-term, a way of changing the culture.

First of all, there has to be an interest in gathering some data, and that can be difficult to establish, because we don't really have a culture that is comfortable with data; it's actually fearful of data. So, setting up a-a friendly and curious environment, which is a lot about discussion, I think, and some positive example within friendly confines, and then people grow in confidence, and kind of expand outward to larger data usages on a grander scale (P. Gosset).

The discussions relating to data fit roughly into four categories. The first is about using data generally. The emphasis is on learning technical aspects of working with data - where you can find data, how to determine data quality, processes for engaging people into use, what data can tell you. The second category is talking about one's own data and what it means. Typically this sort of discussion is aimed at determining where there might be achievement problems in the district or school or in a classroom, what kinds of students are having difficulties. A third kind of discussion, and one that is rare, is what the data shows to be an effective remedy for the problems that have been highlighted. This kind of discussion is closely related to the decision-making role of data. A fourth kind of discussion, equally rare, is what the data shows about whether the decisions that were made to address the problem succeeded in having the desired effect.

Superintendent Effron laid out a case for broadly based inclusive discussion:

So if you want teachers to buy in, you want administrators to buy in, parents to buy in etc, you have to be willing to invite them into the conversation. And you have to be willing to compromise in your decisions, to take-you know, to I guess, you know, reflect their wishes. So if you invite them in

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<sup>36</sup> The terms 'discussion', 'conversation,' and 'discourse' were largely interchangeable.

and you don't accept their input, it won't last very long. And so it-people have to be willing to compromise and respect the different opinions and in the end, it's that trust and that buy in that allows it to be successful and move forward.

Discussion in this instance includes having a say in the decision-making, and not just finding out about what is going to happen, or providing opinions that will as a matter of course be ignored. As stated by Superintendent Cox, "We're all in this together as opposed to the top down."

A key aspect of engaging staff and community was to focus the conversation on data rather than the "blame game" (B. David).

We never went around shaking fingers at them or pointing fingers; what we did is help them for the conversations with teachers, student's parents and then PACs first and then school planning councils next. Communities, Aboriginal bands, Aboriginal councils; it just built over time it was kind of like a snowball rolling down a hill

Superintendent David felt that the discussions contributed to "significant improvement" in Aboriginal student success. Superintendent Gosset characterized the needed discussion in terms of a dialogue relating to interpretations, implications, and actions stemming from the data.

And then once you've gathered it, you need mechanisms for interpretation and the drawing of implications and subsequent actions, and that requires dialogue amongst the many people who have the potential to have an impact on the data that-or the outcome that the data has measured. I don't think it should be done in isolation by single parties. I think it should always be interpreted in some dialogic process. So, get the will; get the data; get the discussion; get the carry through.

Discussion was seen as a kind of incubator for the data out of which would emerge understanding, meaning, and commitment to action. "... all data does is give you some information to start the conversation, because data out of context is just meaningless" (G. Student). Superintendent Freidman made a similar point about data

starting a conversation as opposed to being a summative reflection on teacher performance. She characterized the discussion as a “window into practise and a window into voluntary commitment to improving practise as opposed to some form of a lever that’s intended to apply pressure.”

Although the data often sparked these discussions and connected them to practise, Superintendents did not always see the discussions as primarily being about the data. Superintendent Student saw data as tool to generate questions “So for me, data are a very powerful tool to get people to ask questions, to reflect on their practise, to probe deeper”. Superintendent Benjamin was clear that the purpose of the discussion was not to focus on data, but to focus on a set of key questions.

I don't know whether we go into this saying, "We're going to use data." I think we go into it with the approach about what are our kids learning, and how are we going to be able to determine what the kids are learning? And they come to the realization that the data are providing that information. So with that information and a wondering of how they're doing, they've been able to get over the-get a quotation of data, right? It's informing their instruction that they're more interested in, and data just seems to be the vehicle that moves them along (O. Benjamin).

Good questions led to a desire for answers, which then required gathering and analysis of data. Superintendent Fisher reported on going to schools and asking “our 13 to 14 questions” which would lead to a good discourse. He said that by the end of the day “a lot of staff were asking for information”. Superintendent Cochran saw starting with questions as a way of making sense of the data.

We now start with questions and try to gather evidence that answers the questions as opposed to just gathering a bunch of stuff and seeing if that brings up any questions... something that’s transforming our work around data are Inquiry, getting the question in the right order. It’s starting with a question and then working to gather the data. And it’s a fairly subtle shift, but it makes sense to teachers. It makes sense to everybody.

### **Structural support.**

Whatever the Superintendent has done to prepare the culture and to engage staff in data use, nothing can happen unless there is data to use. Consequently the first order of business is to generate data which will be sufficiently credible and reliable. Once data are collected, an infrastructure must be in place to make it accessible and understandable at all levels. Depending on the amount of data and the size of the district, specialized staff may be called in to help organize, distribute, and analyze the data. Superintendent Nightingale described the challenge.

I think that every level of the organization absolutely requires a person to use information and data in order to be able to understand their job and understand of the actions that need to be taken and you simply cannot function without good information. I'm not sure that we in our business figured out a way to provide every level of the organization with the information and a climate in which to enable people to use that information in a way that can result in the best actions.

What the Superintendents need to determine is a very broad strategy to collect the right data and to make it available in the right form to each level of staff to support the right actions. As Superintendent Neyman expressed it, "... that suggests that we've decided what ought to be collected, found a way to collect it, and had an environment in which we can put it where we could use it intelligently for all kinds of queries."

Superintendent Efron emphasized that the challenge was to enable a wide range of people to use data. "Where you're putting data, the ability to use information, easily and effectively and in real time, into the hands of a whole bunch of people. That's where the big differences are going to be..." (T. Efron). Superintendent Neyman stressed the need, in organizing data, to make it coherent and part of an action plan.

As we use that, it's with an eye toward making it coherent, understandable, contextualized, particularly with respect to what does this tell us about



things we don't know, as much as things we do know. What does this tell us that is either consistent with, or inconsistent with other measures that are trying to achieve the same ends, and then to take all of that and use it for planning purposes, because it's really interesting to see how you're doing. But it doesn't matter as much as what you're going to do about that.

An important service the district administrations can provide is to make the data easier and less time consuming to use. "... I have lots of principals tell me how much time they were spending and doing it and it kind of shocked me - how much time they were putting into that so, I wanted to make that easier for them" (B. David). Often, the work of the district administration is simply to reduce the amount of data. "So what have I done since being Superintendent? Got a little smarter and collected a lot less data to make it more manageable" (L. Anscombe). Superintendent Nightingale simplified the data by paring it down to "the information that you need for a particular purpose at a particular time."

Superintendent David organized district support according to the capacity of the principals. "Part of the work is to give the principals that know what they needed what they needed in a way that takes less time and the other part is work with the principals that don't know."

### ***Having data.***

We've got some really good things happening in some of our schools that are focused around collaboration. They're not focused around data in the way I'd like them to be right now. But they're coming together and they're finding opportunities to talk and to share. And now the next step in my mind is how you then get them to start looking at data in a really broad way. But I need the data! (G. Student).

Because having data are obviously central to being able to use it, one of the clearest indicators of differences in the capacity of different districts' staffs to use data is to determine what data are available in each district. Several Superintendents noted that

until very recently their districts had no student achievement data at all. "When I got there, there was, basically, no data. And the only data the District really had anywhere was what was in the Ministry's collection. So, we had no central system for which data was being collected. So, it's a very new practise for us" (Superintendent Barnard).

Superintendent Smith faced the same challenge when she took over the superintendency of her district.

Well, we look at the Ministry stuff, right? But other than that, what do we use? This is something we're just working on. Our district has not been very good at it. We're just revamping our whole accountability contract because we were saying stuff, we're doing this and that. We had no data. We weren't following cohorts. We had no trends.

In contrast, Superintendent David spoke about having been gathering data for at least 10 years. The expression he used to describe his district's situation was "data rich and analysis poor."

Most Superintendents, after beginning to collect, data quickly realized that they would have to pay attention to data quality. "... having some [data] is good. So you've got to collect some stuff, but it's got to be meaningful" (I. Cochran). Superintendents commonly referred to the need for some sort of consistency or coherence to the data.

I don't think you can do that [use information] at all let alone well, without really good data, and on the achievements front, that means high quality authentic classroom-based assessment data (F. Neyman).

Well, a much greater standardized base of data and data management that would extend to all schools as opposed to sets of schools that are doing things one way, and other schools are doing things another way. So an awful lot - a much more systemic sense of given data and given areas with high consistency (Q. Box).

Once you get a kind of a will and a curiosity, you have to have data-gathering mechanisms. And to get data that is absolutely consistent in terms of the way it's collected and the standards of rubrics that are used in - in getting it together is very difficult. (P. Gosset).

Eventually large sets of meaningful data that is consistent and reliable are built up in the districts. Their challenge is then to develop and a technological infrastructure that can put the right data into the hands of Superintendents, district and school administrators, and teachers at the right time.

***Technostructure: Tools, technology, and technical expertise.***

When Superintendents are talking about the specific assessments that they have used or are introducing to the district they typically refer to them as tools. This usage is consistent with the observation made earlier that Superintendents' interest in data is highly practical.

...we've created tools that look at the areas that we need to measure. So anything that has a performance standard attached to it, we've developed a tool for that. Anything that has a performance benchmark attached to it, anything that has a reading benchmark, we've developed tools for that (R. Gumbel).

The purpose of the assessment tools is clear. "In order to get data, we also need to do some assessments. It doesn't mean we have to be assessment-driven but we need to do it-our ability to gather that data" (E. Elo). The emphasis is on getting at the data and not on contemplation of the finer aspects of the assessment.

If you use DRA and you're using DART and you're using something else and something else, does that really matter? Because we could argue about that for the next fifty years, and I don't want to argue about that any more. You're using something. It's good. We talk about what you're using, why you're using it, and as long as that's a good tool and it works for you, fly at her (I. Cochran).

Superintendents also use the word "tool" when speaking about software and databases that are used to collect, store, and report on data. Superintendent Nightingale noted a need for have "a tool that allows the Superintendent to be able to get really quick

access to the high level information easily.” She goes on to describe the challenge of managing data.

I get the other part is how do you gather the information that's useful and correct but then manage it in a way that allows student to move through the system so that intelligence isn't lost and so that from one year to the next everybody isn't trying find out the same thing about but the child and right from what strategies are working for that student and what isn't what's been tried, and that's an ongoing project right now that they're working on, so how do we find a way to capture what the learning and context issues are and what instructional strategies have actually worked for that kid so that the next teacher or the teacher three years down the road can actually build on that.

The assessments generate data which can support discussions, but those discussions soon generate questions that require better access to the data. “They aren’t comfortable - one of the principals said to me, ‘I don’t know how to talk to my staff about data. I don’t know how to get them to dig deeper. We don’t have the infrastructure in place to support the questions they’re asking” (G. Student). The first databases may be set up by individual schools to look at their own data. “Basically gather it and then somebody clerical will put it in a graph or they'll make a pie-that kind of stuff. And after that we can store it...” (M. Smith). District administrators will often supplement the principal’s data sets with something more centralized.

So, that was a necessary structure to have in place in order for us to work with data because I don’t think our schools are eloquent enough to be able to manage that themselves. So, we needed to have a central spot where they could file it, and then receive support and understanding reports out of it, to segregate it so it was helpful. That was important (H. Barnard).

Superintendent Student described a database set up to track at risk students. “... we have a little database that the teacher goes in and says, here’s the support the kid has, here’s what some of the challenges are. So that that information is readily available to the

next classroom teacher, so you don't spend the first three months figuring out that Johnny doesn't live at home now."

After centralizing the data Superintendents will generally try to organize it to be more consistent and easier to use.

Because I think our job, as district leaders, is to help our schools say, "here's - we're going to cut through the chaff and get to the stuff that's really important, and here's a tool that you're going to use." And whatever that tool is, whatever works for the district, it doesn't really matter. It's a matter of having something that everybody's onboard with, and there's a consistency. It's not just whoever the next software vendor that comes along and says, hey, this is better because it produces nice, live graphs (R. Gumbel).

As the amount of data that is available increases and the questions deepen, the requirements for a more robust data infrastructure grow. "You know, as I said, we're adding graphing, we're adding all the pieces that people are asking for. And the mother ship of our databases is now spawning smaller - it's all relational, so it's not hard to do" (R. Gumbel). When all of the add-ons begin to make the database rich but difficult to use, Superintendents look to the concept of a data warehouse to meet their needs. A data warehouse is a repository of data that is designed to store and retrieve a wide range of data elements for reporting and analysis. Typically the data warehouse would contain information drawn from many sources and databases.

And for us, absolutely the number one thing that's going to make a difference for us right now in the use of data, I truly believe is the data warehouse project and all of that. Because it's not that a data warehouse is magic. It's-it really what it is, it becomes a tool to access the data that's already there and simply what it does, is by freeing up time and by placing data, information in the hands of a whole bunch of different people in a much easier way, I think we're going to do some wonderful things...it's maybe the piece that was missing (T. Effron).

Superintendent Gosset felt the warehouse concept could be usefully applied across districts.

If we could ever develop some sort of data warehouse with overlying inquiry tools that was common in all of the districts, that would be tremendously helpful, because then, at least, you could engage in a prolonged campaign of teaching, and building more of a culture of curiosity about data, and then turning to these - to these data tables, and trying to use data as a tool, because the dearth of data, and the dearth of data in a usable form, and that addresses the question you have right at the moment is a significant problem. So, I know that's a big hill to climb, but that would be very useful.

Clearly the sophistication of the data infrastructure is related to the richness and amount of data collected in the district. As previously noted, districts display a wide range of data readiness, and consequently utilize different infrastructure solutions. The common elements of all these solutions are captured by a comment from Superintendent Neyman.

If, when you've - if in the process of collecting it for use, you've embedded it in a good software environment, then it becomes really useful. An environment where you know what makes it good, you know, that it's-that you're able to store, not just global scores by groups of kids, not just global scores by individual kids, but specific, consistent, over time aspects of learning described by data attached just to track it over time.

***Specialized data support staff.***

The gathering of many different kinds of data; its storage, its retrieval and analysis to improve student achievement is a relatively new function for Kindergarten-Grade 12 education system in BC. To use data effectively requires a combination of technological expertise, a reasonable understanding of statistics, technical skill in the analysis, display, and discussion of data, as well as grounding in education process. Except for the last item, these are not skills taught in faculties of education in BC. Most Superintendents recognize this and bring in specialized data support staff as part of their data infrastructure.

You've got to have an infrastructure to support data management. And then you've got to have the personnel who can actually do the manipulation of the data to give you the information you want... I think you've got to have

somebody who can help you analyze the data, because that's not everybody's work. You need to have, be able to generate the questions and then have someone go in and bring you some answers that then starts the next conversation. That's the piece I'm missing right now. I don't have somebody I can go to and say, manipulate the data for me (G. Student).

Superintendent Benjamin considered a data manager to be the "first structure that we have to support the use of data." His data manager trains the principals, gathers the data and "gives the data back out to the schools in a way that the schools can use it. In the past they used to get a 2-inch binder of paper on all the data, and nobody was looking at it because it was just so large and onerous." The data manager is also expected to ensure the data are consistent and clean. Superintendent Cochran noted that the process of managing data can take an inordinate amount of the principal's time.

...we are limited by our ability to sort of actually, manipulate the numbers because that's an easy way to turn data more quickly into information. .... We still rely on tables that principals fill in almost by hand and, you know, they type numbers into tables and that's kind of where we go. I guess we need the ability to speed the process up, and we don't really have that in-house. Like we don't have anybody that's a-that's there. And schools are asking for that now, which is great. Is there someone out there who can help us do that crunching kinds of things (I. Cochran).

For Superintendent Efron the challenge was to enable principals to make the most out of the data available to them. "...a lot of people wanted to do things with data, it was just trying to - it's just having the time and the expertise to do it. And if time isn't a factor and hard core, you know, sort of technical knowledge is not a factor, then information is sort of accessible to everyone."

Though some Superintendents initially approached the need for specialized data support by bringing in temporary help, most eventually established this function as a full time position. Superintendent David had hired a full time district data coordinator but decided to replace him with a contractor to save money. The contractor was expected to

“do some reports for us and that type of thing so we could help principals understand.”

Superintendent David soon realized, however, that the district’s need for specialized expertise could not be met by a part time contractor.

I knew we needed to have somebody specifically committed to working with principals on a day-to-day basis to really make sense of that and to put it into easily understood graphic reports so that power points however we needed to represent it in ways that everybody could understand it, specifically individual students, groups of students, classes, schools, district that's what we needed.

Virtually all the Superintendents who were setting up a supporting infrastructure either hired someone immediately or eventually to connect the technical, technological, and educational requirements of managing data effectively.

### **Findings: Considerations from the Literature**

This dissertation examines the way in which school Superintendents manage the relationship between data and data use. Through my analysis of the 22 interviews with school district Superintendents I was able to see key patterns in how Superintendents understood data, how they used it, where they thought the major barriers to use were, and the strategies they used to promulgate the use of data to improve student performance. These patterns are described in my findings. Following the analysis of the interviews I turned to the literature with three objectives in mind: 1) to see if the patterns I found were confirmed by research; 2) to discover any missing elements that might be important to the BC situation, and 3) to attempt to determine where there might be ‘holes’ in the research that could be addressed by my findings.

I attempted, in the initial search, to locate specific books or theses in which the main topic was how Superintendents use or manage data. The Google Scholar request for



'Superintendent' *and* 'Data' in the title produced one current thesis, one article from 2005, one book published in 1985, three citations, and a 1964 order from the Superintendent of documents. Replacing 'Data' with 'information' led to 29 hits, none of which related to how School Superintendents used or managed data. Referring to 'knowledge' rather than 'information' was no more productive - I got seven hits and none concerning school Superintendents using or managing data. The paucity of relevant literature available through Google Scholar was replicated in my searches of library catalogues of books, periodicals, Digital Dissertations data base, and other publication sources. There was however, a great deal of information on 'data/information/knowledge/management', 'education change', 'school culture,' and, inevitably, 'leadership.' As much as possible I winnowed each of these areas to focus on the Kindergarten-Grade 12 education system and the Superintendency.

### **Data to knowledge.**

The BC Superintendents tended to conflate the concepts of data, information, and evidence. However, the literature was replete with distinctions between these and other related concepts related such as knowledge and understanding (Honig, 2006; Glickman, 2004; Thorn, 2001; Davenport & Prusak, 1998; Brown and Duguid, 1991). A number of researchers (Empson, 1999; Davenport & Prusak, 1998) emphasize the close relationship among the concepts of data, information, and knowledge by defining them in relation to each other. Empson defines data as objective facts, without context. When the data are made relevant by being analysed and contextualized, it becomes information. Information in turn is transformed into knowledge when it is used to "make comparisons, assess consequences, establish connections, and engage in a dialogue. Knowledge can,

therefore, be seen as information that comes laden with experience, judgment, intuition, and values” (Empson, 1999). Mandinach (2006) describes a similar progression from data to knowledge.

Data exist in a raw state. They do not have meaning in and of itself, and therefore, can exist in any form, usable or not. Whether or not data become information depends on the understanding of the person looking at the data.

Information is data that is given meaning when connected to a context. It is data used to comprehend and organize our environment, unveiling an understanding of relations between data and context. Alone, however, it does not carry any implications for future action.

Knowledge is the collection of information deemed useful, and eventually used to guide action. Knowledge is created through a sequential process. In relation to test information, the teacher’s ability to see connections between students’ scores on different item-skills analysis and classroom instruction, and then act on them, represents knowledge. (p. 3)

The 'raw state' of Mandinach’s data and the objective, context-free data of Empson share a common sense of being much like raw material waiting to be processed. Processing them into information makes them relevant, gives them meaning. Bateson (1979) said information is “Any difference that makes a difference” (p.228). When information is used it becomes knowledge. More specifically, according to Davenport & Prusak (1998), the progression from data to knowledge is a process of adding value. “Knowledge is information combined with experience, context, interpretation, and reflection. It is a high-value form of information that is ready to apply to decisions and actions.” Deming (1994) is more specific. Knowledge is prediction: “The theory of knowledge teaches us that statement, if it conveys knowledge, predicts future outcome, with the risk of being wrong, and that it fits without failure observation of the past” (p.102).

The 'data' that interested the Superintendents I interviewed would more appropriately be described as knowledge as described by Davenport or Deming. As managers, the Superintendents are interested in the practical value of the 'data/information/knowledge' entity. They want it for decisions and actions, guided by prediction. This being the case, the problem of interest for the Superintendents would better have been expressed as a problem of knowledge management, not data management.

This may seem to be a small point of definition but it is pivotal in establishing a better theoretical "fit" (Glaser, 1978) for the data provided by my interviews with Superintendents. To understand data as a component of 'knowledge management' rather than 'data management' accounts for more of the information provided to me by the Superintendents. In order to more fully exploit this useful distinction I will use the term 'data-based knowledge' when referring to data that has been transformed so that it may appropriately be used for "decisions and actions" (Davenport & Prusak, 1998).

### **Knowledge management.**

Edge (2005) and Fullan (2001) note the irony that educational organizations, which are knowledge focused organizations, have generated little research or discussion of knowledge management as a strategy for improving organizational practise, program implementation and teaching and learning" (Edge, 2005; Stigler and Hiebert, 1997). Stigler and Hiebert (1997) identify the need to document explicit knowledge about instructional practise. They argue that "(w)e must study directly the processes that lead to learning in the classroom, for if we do not understand these processes we will have little

chance of improving them” (1997, p.2). One of the advantages of framing data use in terms of knowledge management is that knowledge management has been studied for several years in many organizations and most professional and industrial fields have determined that the generation of knowledge about and improving the quality of the processes is the “surest road to improving products, but we in education have yet to learn this lesson” Hiebert (1997).

Petrides (2002) writes that the "core" of knowledge management is the progression of data to information to knowledge.

It starts with a basic assumption that the accumulation of data are influenced by the core values of the school organization or a department, grade, or team within the school and that these data through some process of human interaction and information technology then take on significance and importance as information. Next, through the process of context, accumulation of data, sense making, synthesis, and reflection, this information is transformed and converted to knowledge that is relevant to educational decision-making within the school as an organization. This may or may not produce an action step, but it does influence the next round of data accumulation in terms of deciding if the current data collected meet the needs of school administrators and teachers (p. 1707).

Although the literature is replete with descriptions and definitions of knowledge management (Petrides, 2002; Edwards, 2002), there is general agreement that it involves three key stages: acquiring/creating/sourcing; compiling/retaining/organizing, and disseminating/sharing (Holsapple & Joshi, 1998; van der Spek & Spijkervet; 1997 Wiig, 1993). Ruggles (1998) provides a list of knowledge focused activities that provide additional detail about the processes of knowledge management.

...generating new knowledge; accessing valuable knowledge from outside sources; using accessible knowledge in decision-making; imbedding knowledge and processes; representing knowledge in databases; facilitating knowledge growth through culture; transferring existing knowledge into other parts of the organization; and measuring the value of knowledge assets and/or impact of knowledge management (p. 81).

The study of knowledge management originated in research into data and information management, and management systems. While much of the literature, particularly from the education domain, reflects the emphasis on technology (Edge, 2005), research is increasingly taking into account the human and social elements (Edge, 2005; Edwards, 2002; Davenport and Prusak, 1998). Marshall, Prusak, and Shpilberg (1996) take the view that the focus of knowledge management “goes far beyond the storage and manipulation of data, or even of information. It is the attempt to recognize what is essentially a human asset buried in the minds of individuals, and leverage it into an organizational asset that can be accessed and used by a broader set of individuals on whose decisions the firm depends” (p.79).

The framework of knowledge management has taken us from data through information to knowledge and has located that knowledge in the minds of human beings, with technology playing a supporting role in managing it as an organizational asset. This is very similar to the picture that emerges from interviews with BC Superintendents.

### **How is data-based knowledge used?**

BC Superintendents use data-based knowledge in four general areas: accountability; communications; discourse; and decision-making. These purposes for the most part echo what is found in the literature. Earl (2006) notes that common uses of data include: “Discover issues, diagnosed situations, forecast future conditions, improve policy and practise, evaluate effectiveness, promote accountability” (p.14). Honig (2008) noted a number of studies showing district administrators using evidence for decisions about school improvement. What I categorized as "understanding and communications”

included using data-based knowledge for political purposes -- as a tool of persuasion and change in support of school improvement efforts. Similarly Honig reports that Corcoran, Furman, & Belcher (2001) and Marsh (2007) found school district administrators used evidence to develop political support for school improvement programs.

***Decision-making.***

BC Superintendents recognized that a core role of data-based knowledge was to *support* decision-making. None used the term 'data-driven' in relation to decision-making. Superintendent Elo emphasized that the decision is made by the Superintendent, not the data. "... data can't—is not ever going to be the Superintendent. I'm never going to stand up and tell somebody that were heading in this direction because the data tells us so." The distinction between seeing a decision as a rational, almost inevitable product of the data, and seeing the decision as a more complex process that takes into consideration a wider set of knowledge than that provided by data alone is usefully distinguished in the literature.

There is a distinction between what Hoyle (2004) calls the classic model, and an approach that was characterized by Lindbloom (1990) as “satisficing” or “muddling through.” The classic model set out by Hoyle and incorporating the work of Hoy and Tarter (1994), Griffiths (1999), and Hoy and Miskel (1978), outlines five sequential steps.

1. Recognize and define the problem.
2. Analyze the difficulties in the existing situation.
3. Establish criteria for a satisfactory solution.

4. Develop a strategy for action, including the specification of possible alternatives, the prediction of probable consequences, deliberation, and the selection of the action plan.

5. Initiate the plan of action (Hoy & Tarter, 1994).

In its pure form this approach would require more time and resources than any organization could provide (Lindblom, 1990). Even if the process were attenuated by using "partial information and data to make satisfactory decisions under circumstances in which it is difficult or impossible to optimize information gathering" (Hoyle, 2004), there would remain the problem of the assumption that each decision should be approached "completely from the ground up" (Lindblom, p.281). Lindblom's alternative is to make decisions incrementally, taking small steps and incorporating learning from the results of those steps into the next decision. The hesitation of Superintendents to fully embrace a data-driven decision-making model is consistent with an incremental decision-making approach that incorporates data-based knowledge as only one of the relevant form of knowledge.

### **Barriers to the use of data-based knowledge.**

The BC Superintendents studied here identified a number of conditions hindering the use of data-based knowledge in their districts. These conditions fall into two groups: those related to formal structure and resourcing and those related to culture and politics. The structural/resourcing conditions included lack of data, deficiencies in technology, and staff without the necessary skills. The cultural/political conditions are attitudes, beliefs, ideologies, and political activities that oppose the widespread use of data-based knowledge in districts.

Most of these conditions are reflected in the literature. Edge (2005) and Petrides (2002) identified structure and resourcing challenges such as technological limitations, teacher time, budgetary restraints, incompatible data sources, quality of data, and the ability of staff to interpret data. Davenport and Prusak (1998) included culture, beliefs about knowledge, and frames of reference in a list of barriers to knowledge management. Earl (2006) highlighted the discomfort teachers feel when faced with data that challenges what their experience, personal beliefs, and value systems tell them is true. Fullan (2001) observes that schools are poor at sharing information internally, and with other schools in the same district. “Most schools are not good at knowledge sharing within their own walls, let alone across schools in the same district” (p.104). Glickman notes that “This normative education system milieu sets the environment in which barriers to change flourish” (Glickman, 2004, p.36).

In describing the challenges to data-based knowledge management in BC, the Superintendents focused most of their attention on structures and cultural/political issues, leaving administrative process issues relatively unexamined. But as Elmore (2000) points out, administrative process may play an important role diverting focus from activities, such as knowledge management, that are designed to improve instruction.

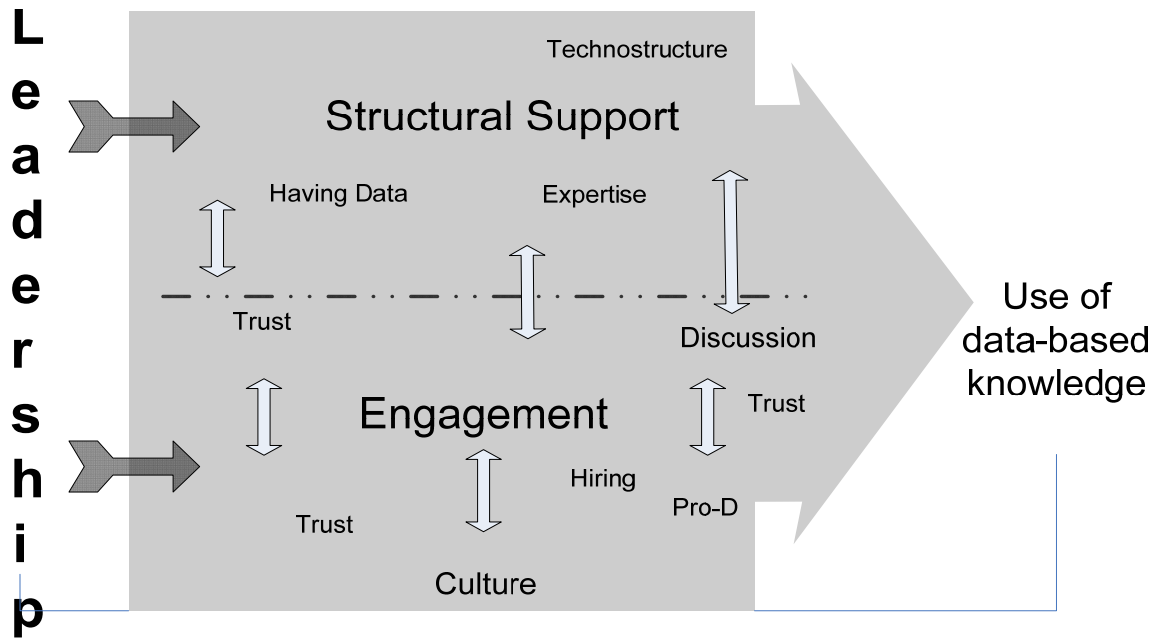
Administration in education...has come to mean not the management of instruction but the management of the structures and processes around instruction. That which cannot be directly managed must, in this view, be protected from external scrutiny. Buffering consists of creating structures and procedures around the technical core of teaching that, at the same time, (1) protect teachers from outside intrusions in their highly uncertain and murky work, and (2) create the appearance of rational management of the technical core, so as to allay the uncertainties of the public about the actual quality or legitimacy of what is happening in the technical core (p.6)



One concern of major importance to the Superintendents of BC did not appear to be well covered in the literature. This was the presence of a well-organized political opposition to the use of data-based knowledge as a means of improving student achievement. Such an opposition is able to take the existing structural and cultural barriers and imbue them with the immediacy of political resistance. Without reference to the experience of other jurisdictions in dealing with this kind of barrier, it is necessary for those who support data-based knowledge use in BC to be particularly receptive to learning from the successes and mistakes within their own jurisdiction.

**Supporting knowledge management: Leader’s strategies and leadership.**

Superintendents in BC support the use of data-based knowledge through a range of mutually reinforcing strategies which address staff engagement and structural support. Figure (3) illustrates the broad reach of leadership necessary to align the constituent elements of data-based knowledge use.



**Figure 3. Leadership operates through alignment of engagement and structural support to support use of data-based knowledge.**

Structural support includes ensuring a supply of good quality data, providing staff with the tools to work with the data, and bringing in specialized support staff to assist educators in managing the data. Engagement involves being prepared to use data (professional development and hiring processes) and, critically, committed participation in discussion. An organizational culture that supports, or is at least neutral to the widespread use of data-based knowledge in improving student achievement is recognized as a fundamental condition for engagement, and is consequently a matter of great interest to BC Superintendents.

The most prevalent strategy the Superintendents used to bring about both engagement and culture change was discussion. Discussion was the way to get teachers and administrators to “buy in” (T. Effron) to data-based knowledge use. In an interesting reinforcing loop, data was also seen as a way to stimulate and feed discussion.

### *Structural support.*

Much of what the Superintendents spoke about regarding support for data-based knowledge is reflected in the literature, including the recognition that the core conditions of structural support and a positive environment for data-based knowledge generate a reinforcing loop (Davenport, De long & Beers, 1998, Davenport & Prusak, 1998). Thorn (2001) writes:

[Knowledge] Repositories must be built. Then, these repositories are only useful if users have efficient access to the knowledge contained in them. Finally, the use of knowledge in an organization will be enhanced by the creation of an environment that supports this use. This knowledge-friendly environment will, in turn, demand higher levels of sophistication in the knowledge repository, thus closing the loop (4. Manage knowledge as an asset, para. 2).

Darling-Hammond (1993) frames the challenge of using knowledge to improve student learning as shifting from managing through controls on schools to developing the capacity of school staff to produce and use knowledge. This capacity is dependent, in part, on providing educators with appropriate tools and technology (Mandinach, 2006; Edge, 2005; Petrides, 2002; Thorn, 2001; Streifer, 1999). In 1999 Streifer asserted that knowledge-driven schools would not materialize until affordable information tools are supported by school administrators. Mandinach (2006) warns that schools are faced with “an explosion of data” which can only be managed through technological applications.

As many educators say, they are data rich, but information poor. By this they mean that there is far too much information with which they must deal, but those data are not easily translatable into information and actionable knowledge. One goal of using the tools is to facilitate the mining of data from multiple perspectives that ultimately will provide the user with information from which they can make decisions (Observations from the Sites: School Issues, para 2).

Mandinach also note reassuringly that the needed tools are now available.

“...advances in school networking infrastructures and online data warehousing have

made it feasible to create systems that use assessment data to support decision-making, by providing timely information and presentation and analysis tools to educators across multiple levels of the system.”

### *Culture.*

If structures to enable knowledge management need to be brought in to the school system to support knowledge use, the foundation on which they will ultimately succeed or fail is the school culture. Cultures consist of deeply held beliefs about the way things are and should be (Handy, 1999; Schein, 1996; Owens, 1991). Built up over time, cultures are “highly enduring, have a powerful impact on performance, and shape the ways people think, act, and feel” (Deal & Peterson, 1999, p.4). Schein (1988) asserts that culture is a group experience learned over time as the group develops a “pattern of basic assumptions” while coping with its problems of “external adaptation and internal integration.” The assumptions have worked well enough to be “considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems” (p.9). The assumptions become routine and “drop out of awareness.” Culture then is largely unconscious (Deal & Peterson, 2003) though its effects are seen everywhere.

Beneath the conscious awareness of everyday life in schools, there is a stream of thought and activity. This underground flow of feelings and folkways wends its way within the school, dragging people, programs and ideas toward often-unstated purposes: ‘this invisible, taken-for-granted flow of beliefs and assumptions gives meaning to what people say and do. It shapes how they interpret hundreds of daily transactions’ (Deal and Peterson, 1990. p.7).” (Deal & Peterson, 1999, p.3).

Sutherland (2004) points out that educators interpret reform using the “beliefs, values, assumptions, and practices” stipulated by their culture. Reform efforts,

consequently are “actually efforts to change the culture of districts, schools, and classrooms.” He concludes that given the “premise that culture is constantly being constructed through interactions with others, then educators and researchers must take the developmental trajectory of the school's culture into account when attempting to explain the process by which schools move towards using data for improvement purposes”. (n.p.) This trajectory would include recognizing the effect of culture on the leaders themselves if Schein (1988) is right in his argument that mature cultures (those with a long and rich history) are “predisposed” to certain kinds of leadership, and consequently “Leaders create cultures, but cultures, in turn, create their next generation of leaders” (p.313).

Earl and Katz (2002) suggest that a "culture of inquiry" would include broad involvement of knowledgeable educators in interpreting and engaging with data. "When groups of people in a system have intimate knowledge of the data and have argued about its meaning and applicability, they have the possibility of developing a shared purpose and working together to reach their goals.

### ***Professional development.***

BC Superintendents clearly understood the need for comprehensive professional development of all staff or data "just ends up being a problem rather than a solution" (Superintendent H. Barnard). The literature is dense with injunctions to be aware of the need for training and follow-up (Horton, 2009; Honig, 2008; Darling-Hammond, 2007; Schmoker, 2006; Dufour & Eaker, 1998; Bolman & Deal, 1997; Darling-Hammond, 1996). Without training and support, Darling-Hammond (2007) warns, the conversation will revert back to school business and curriculum and away from instruction.

Part of the professional development needed is for educators to become more confident and skilled in using data. Hoyle (2004) highlights the need for school staff to analyze, interpret and apply data strategically while Williams (2002) emphasizes techniques of data analysis.

Elmore (1997) connects the success of efforts to improve student performance to professional development which increases teachers' knowledge about instruction.

...one has to assume that changes in policy and organization will result in a different kind of teaching, which will in turn result in a different kind of learning for students, who will in turn demonstrate this learning by doing better on measures of performance. One key element missing in this formulation, however, is the *knowledge* required for teachers and administrators to engage in a different kind of teaching and learning. Policies, by themselves, don't impart new knowledge; they create the occasion for educators to seek new knowledge and turn that knowledge into new practice. Hence, professional development is the main link connecting policy to practice (p.2).

Elmore sees professional development as central to the job of the administrator, not as a specialized function. "Instructional improvement is the main purpose of district administration, and professional development is the chief means of achieving that purpose. Anyone with line administrative responsibility in the organization has responsibility for professional development as a central part of his or her job description" (p.12).

### ***Professional learning communities (PLC).***

A key strategy in pursuing reform is the creation of and support for professional learning communities/communities of practise (Williams, 2002; Fullan 2001; Senge *et al.*, 2000). A community according to Bellah (1985) is a group of people who are "socially interdependent, who participate together in discussion and decision-making, and

who share certain practices that both define the community and are nurtured by it” (p.351). In defining school based professional learning communities, Blankstein (2004) emphasises that teachers “pursue a clear, shared purpose for all students’ learning, engage in collaborative activity to achieve their stated purpose, and take collective responsibility for student learning” (p.53). Over time PLC’s will foster the development among its members of shared attitudes and beliefs and build high levels of trust (Dufour & Eaker, 1998; Schmoker, 2006), strengthening a culture of collaboration.

A number of researchers (McLaughlin, 2006; Schmoker, 2006; Blankstein, 2004; Dufour & Eaker, 1998; Hord, 1998; Klonsky, 1995; Kruse, Louis, & Bryk, 1995) suggest that learning communities are a promising means for improving schools. Horton (2009, n.p.) quotes a study by Newman & Wehlage as finding that most successful schools are “learning communities in which teachers pursue a clear shared purpose for all students’ learning, engage in collaborative activity to achieve that purpose, and take collective responsibility for student learning (Newman & Wehlage, 1995, p.30). Eilers (2007) reports that PLCs combined with an “evidence based culture” promote high-performing schools.

### ***Trust.***

The BC Superintendents in this study spoke regularly of the need for high levels of trust in the district. They understood that a large reservoir of trust was needed to prevent fear and uncertainty from overwhelming the process of engaging staff in the use of data-based knowledge. The Superintendents realized that the job of building trust was their responsibility, one that could not be delegated.

The literature provides evidence that trust is a valuable but fragile resource (Louis 2007). In organizations characterized by high levels of trust, leaders can implement change without invoking high levels of suspicion. Sullivan & Transue (1999) suggest that trust may even make people more willing to partake actively in the change process. Bryk and Schneider's (2002) study demonstrates that trust is a resource for improvement for elementary schools, and Louis (2007) shows that trust has the same effect in high schools. Trust can be relational or institutional. Louis (2007) proposes that relational trust depends on "patterned interactions between people who work together on a regular basis, and the assumption is typically that if untrustworthy persons are replaced with more trustworthy ones, or behaviours change, the levels of trust will also change (albeit perhaps not instantly)." Strong patterns of trust can become more deeply embedded, and "can, to some extent, be said to have become institutionalized" (Louis 2007).

### ***Leadership.***

The challenge at hand is one of the embedding and sustaining the capacities for using data wisely. Developing an inquiry habit of mind, becoming data literate, and creating a culture of inquiry are processes rather than singular events. And they are developmental processes, following a trajectory of sophistication by which competence unfolds that the individual level, in the perpetual refinement of that first painting, and in the expansion of images to a gallery full of paintings (Earl & Katz, 2006, p. 101).

The interviews with BC Superintendents were in effect portraits of how each Superintendent approached their leadership responsibility in "embedding and sustaining the capacities for using data wisely" in their districts. They all understood that knowledge-based data was an important resource in improving the performance of students, and each was committed to improving their district staffs' ability to use the resource.



The literature has a good deal to say about leadership. Cousins (2006) concluded that leadership was “pivotal” to implementing and sustaining enquiry in schools.

Leader’s propensity to embrace and value inquiry as well as to model the use of it had a potent effect on staff interest and commitment to engaging with local knowledge production in this way. School administrators in these schools were generally found to be highly collaborative, change oriented, and transparent about school matters with staff and community. Data were often used as a basis of opening up discussion and dialogue (Supportive Influences, para. 1).

Conzemius & O’Neill, (2001) and Earl & Katz (2006) assert that developing leadership capacity is a requirement for a major reform of the educational system. Hoyle (2004) claims that distributing leadership throughout schools and the district to nurture a culture is essential to creating and sustaining communities of learners. What these researchers have in common, apart from opining about leadership, is that they are all focused on leadership at the school level.

Historically, the literature on Superintendent or district leadership of change initiatives has been sparse (Muller, 2004). This may be because few Superintendents actually took on the role of leading change (Elmore, 2000). Despite indications from Muller (2004) and Hawkins (2006) that this deficit in the literature is beginning to be addressed, there are still few studies focused entirely on the role of the Superintendent as a change leader, and fewer still on specific areas of change, such as the role of the district administration in building leadership (Edge 2005; Hoyle, 2004). Nevertheless, some consistent research findings are beginning to emerge about the core functions of district leadership (Muller, 2004). Muller found that the district must become the leader in knowledge creation, in the development of a collaborative environment, and in a commitment to quality in all functions. He noted that the district can also lead through

improved collection, analysis and use of data for decision-making and community-building. In examining the conditions necessary for the development of professional learning communities, Horton (2009) found that the district must create a sense of urgency for changes, find and develop resource support for the project, and focus the project so that initiatives unrelated to the change do not distract from the effort.

## CHAPTER 5: THEORY

I chose for this project to develop a theory that would help practitioners (Superintendents) understand and improve data use in BC school districts. The method of research, ‘grounded theory’ guides the researcher to collect data about a phenomenon of interest. The main problems, patterns and hypotheses which constitute the theory emerge from the data (Glaser & Strauss, 1967). Grounded theory does not begin with a theory or hypothesis to verify; the theory is developed from the data. As the researcher becomes more familiar with the data, different hypothesis are tested against the data to determine which appear to have the most explanatory power and plausibility.

The theory I am proposing is that the breadth and depth of the use of student achievement data in school districts in BC is a function of the interaction of two complex categories, or variables: staff engagement and structural support. These variables interact to create a trajectory of data use from none to relatively integrated, constant and widespread use among district administrators, school administrators, and teachers. This trajectory takes the form of five distinct phases: 1) Before Data; 2) The Beachhead; 3) Widening Discussion; 4) Consolidation; 5) Changing Practise. These phases provide a developmental map on which Superintendents can locate their own districts. The skill and capability of the Superintendent will have an impact on how quickly the district is able to advance, and how deep and sustaining the changes will be.

Each phase has a characteristic profile that is the product of a particular mix of engagement and infrastructure support. The phases can also be seen as processes, each creating an output or outputs that are necessary for the next to develop; consequently the

phases occur sequentially. There is some overlap, but until each phase has matured to the point of creating its critical outputs, the next phase cannot develop. Table 2 shows the phases, along with the critical outputs.

**Table 1: Engagement and Support Characteristics by Phase**

PHASE	ENGAGEMENT CHARACTERISTIC	SUPPORT CHARACTERISTIC
1. Before data	District and school administration, teachers work in isolation. May be collegial relationships, but not collaborative.	No support from district administrators. Some data available at school level if principal is interested.
2. Beachhead	Superintendent and district administration gather and analyse data. Pro-D for administrators. Teachers involved only as data gatherers. Resistance in background.	District staff obtains data and may develop or acquire standardized assessment tools.
3. Widening discussion	Educators spend considerable time and effort in discussion, which is seen as valuable in itself. Extensive Pro-D for all educators. Resistance emerges.	Time is provided for discussion. District administrators provide standardized assessments to save time and improve consistency.
4. Consolidation	Discussion <i>about</i> data is now discussion and planning <i>using</i> data. Pro-D embedded in staffing structure. Strong pockets of resistance evident.	District administrators provides technological infrastructure to help manage data. Data experts hired to make data use easier and more productive for principals and teachers
5. Changing practise	Data informed discussions of student achievement are norm for all staff. Teachers take part in action research; focus of data use is classroom. Resistance has faded.	Funding for research projects undertaken by teachers. Time embedded for collaboration. Deeper analysis supported by the technostructure.

**Table 2: Critical Output by Phase**

PHASE	CRITICAL OUTPUT
1. Before Data	District administrators recognize the need for change
2. Beachhead	District administrators have developed capacity to use data; school level educators are curious and unafraid
3. Widening Discussion	Teachers trust administration; have confidence in their decisions regarding structural support
4. Consolidation	Teachers have confidence in their own capacity to use data
5. Changing Practise	Stages beyond changing practise were not found in my sample of districts, but are discussed in the literature.

The characteristics of each phase include a specific data use profile, and typical strategies that Superintendents use to advance the district to the next phase.

### **Phase 1: Pre-Data Use**

The most obvious structural support characteristic of this phase is the paucity of data available for use in districts or schools. Superintendent Barnard described taking over the district and finding there was "basically, no data. And the only data the district really had anywhere was what was in the Ministry's collection." The situation was similar for Superintendent Anscombe who had just been appointed Superintendent after many years of working in the district. "The other thing that astounded me about our district even though I'd been there for 18 years ...is that there has been very little use of anything tangible other than the sort of traditional, you know, the Director of Instruction used to trot in the provincial exam results. "How come this is up or down?" Data, when it was available, was "an event, rather than a process" (B. David).

In an environment with little data, there are no commonly understood reference points to anchor instructional discussion. Professional practise of teachers and administrators is characterized by a high degree of isolation.

In this phase, data are not used for improvement of student achievement, nor does district staff have any interest in initiating data based discussion or providing support for data use. If data are used at all by the district it is to comply with Ministry requirements.

The end of this phase begins when the Superintendent decides to embrace the use of data as a core strategy for improving student achievement. The stimulus to make this change might be the data itself. Superintendent Tukey was spurred on by the realization

that his district actually had Aboriginal students and that those students were performing well under the provincial average. For Superintendent Gumbel the motivation for data use came from the Ministry requirement for the district to do an accountability contract.

The Superintendent, having taken on the mission of incorporating data use into improving student achievement, must now develop a plan to engage district administrative staff, or if it is a small district, district administrative staff and school principals to support this new strategy. A fundamental requirement is to establish a rationale for change: a key strategy to accomplish this is for the Superintendent to communicate a vision of where the district could and should be; a vision sufficiently compelling to overcome the inertia of entrenched practise.

The critical output of this stage is the acceptance by district administrators of a need to change. A broader acceptance of the change requirement is desirable, but without district administrator support it is extremely difficult to align the strategies of engagement and structural support that are needed to sustain an implementation effort.

## **Phase 2: The Beachhead**

In this phase, the focus of engagement is primarily on the district administrators. This phase is typified by the Superintendent and the district administrators trying to get a 'handle' on the data (in small districts where there are few district administrators, school administrators may be engaged quite early on). Superintendents will, at this point, assemble the initial sets of data that become the content for the discussions of the administrative staff.

Superintendent Anscombe began the 'change' by insisting that all administrative staff meetings include some portion dedicated to using data to report on or analyze a situation. "And what we have tried to do and it started out as being actually quite trite, was I insisted that any agenda items in our central admin team meetings would begin with a presentation of something quantitative." Superintendent Gumbel pressed his administrative staff to establish what data would be most helpful to them.

Once district-level staff have become engaged and begun to feel comfortable with the data they have gathered, they will move to engage school administrators. A key requirement for the success of this phase is to adequately prepare school administrators to embrace data use. "We have to grow some experience... I have a couple of schools filing growth plans with no data attached. And I know that they aren't doing it because they are so uncomfortable about how to do it" (H. Barnard). Superintendent Friedman noted while the district leadership team showed fairly uniform "skill and commitment and comfort level" with data, "there's not the same uniformity or consistency across our schools."

If the district is to successfully move to the next phase, the Superintendent must ensure that the school administrators and teachers do not fear that the data will be used against them. The ability of the Superintendent to reassure staff they have nothing to fear is strongly related to the level of trust between the district administration and teachers.

Though one of the key means of developing trust is through the broadening of discussion and professional development with and for teachers, a certain level of trust must be developed as a condition of broadening engagement. It is clear here that the history of the district and the teachers will be a major factor in how difficult it is to establish the basic level of trust. The essential strategy that Superintendents use at this



stage is intense personal communication that stresses that data are a means for improvement of student achievement, and will not be used against teachers.

I worked at just being visible and having the conversations with anybody that would have them with me, and formal and informal, but just never getting into a place where it sounded judgmental-just talking about it, trying to figure it out together with them, really laying on a lot of support whenever I could see somebody was ready for that. That spreads quickly through a small district, that kind of support. Maybe it's not there entirely (H. Barnard).

This phase has generally been focused on preparing administrators to use data; achievement data may inform some district-level decisions, but plays almost no role in educational decisions at school or class level. During the 'change' phase some teachers may become involved in discussions and exercises to help prepare them for data use, but this is rare.

### **Phase 3: Widening Discussion**

The third phase of the trajectory features the extension of engagement to teachers through broad discussion, and rich data sets. This is the first phase that makes real use of the data in terms of impacting student achievement.

The value of discussion was emphasized by all Superintendents. Initially much of the discussion was about how data could be used, rather than the data itself. As the capacity of teachers to talk about data increases, as they feel more confident, the conversations become more and more focused on real data and the implications of that data for student achievement. Staff begins discussing snapshots of the achievements of groups of students in order to determine whether there are general areas of difficulty that need instructional attention. This approach is later supplemented with a focus on

discovering individual students who are having difficulty. The groups and the individual students are tracked over time.

I'm thinking of the individual kid now and realizing that it's one kid; the travels of a journey in our school district not a series of groups of kids that cycle through grade for every year...I started thinking about the kid coming to us in kindergarten or in our early programs and walking out the door 13 years later, so what information do I need in order to be able to assist with improving that journey for that student? (A. Nightingale).

If the perspective of the Superintendent includes each single student over many years then the full engagement of teachers, principals, and district administrators, is required. There must also be a rich set of data that can inform everyone about the student's journey.

The strategies that Superintendents use to support this phase and prepare the district for movement to Phase 4, include ensuring that principals and staff have time for considerable discussion about the use of data, the development of measures that they feel are relevant, and the analysis of the data to determine what students or groups of students are experiencing difficulties. Two strategies produced particularly deep and lasting effects. First, Superintendents consistently and constantly *modeled* the use of data by friendly but relentless questioning of school administrators and teachers. Second, Superintendents used *learning* as a means of creating ownership for data use. Superintendent Box also expressed the belief that learning could drive deep change in the way the education culture sees data use. "But for me, the deeper and most sort of enduring affect, is to create the kind of professional learning and therefore data appreciating, utilizing culture that I've described to you." For Superintendent Student, widening engagement in data use is about turning the system's purpose and methods back

on itself: "... [it] is about conversation, it's about education. It's about constantly going back and, you know, pounding it home. You know, it's just teaching."

The discovery of areas of difficulty for groups and individuals and the resulting focus of attention given to resources, programming or other strategies for remediation is the core function of the data in this phase.

#### **Phase 4: Consolidation**

In stage three there is a tremendous broadening of engagement as teachers become involved in data initiated and data supported discussions. But the data can easily become uncoordinated. The development of localized data sets takes time from busy principals and teachers. More time is required for analysis, and often the educators do not have the necessary skills to properly analyze the data. Conversations are taking place within schools but it is difficult to support them across the district because of the wide variety of data sets, standards, and approaches.

Phase four is characterized by strong district-level intervention in consolidation of the various data instruments, storage of data sets, and analytical process. The goal is to improve the quality of the data the processes analyzing it, while simultaneously reducing the time and effort required from teachers and principals. Superintendent Neyman envisioned a coherency which would bring consistency to the educational experiences of students.

It looks-it looks like the whole system is coherent and aligned in terms of children's experiences being - all being good experiences because the leaders in the system, or everybody within the organization has been thoughtful and strategic and use the data, the assessment evidence in particular, to understand what's working, understand what might not be, make the right decisions about the right changes that need to be made in a

collaborative kind of a way so that everybody gets it and moves forward together. And, as a result, you have students having high quality experiences throughout the system that are consistent in the right ways in terms of the quality of their experience.

Superintendent Nightingale stressed the need to have a system that did not lose intelligence about the students as they moved from one year to the next, a system which ensured that “everybody isn't trying find out the same thing about the child.” The intelligence includes “what the learning and context issues are and what instructional strategies have actually worked for that kid so that the next teacher or the teacher three years down the road can actually build on that.” The consolidation of data includes helping schools focus on the data that will yield the most value to the educators.

The three core strategies that Superintendents use to support Phase 4 are: 1) provide resourcing for data consolidation and to improve the consistency and quality of the measures that teachers and school based administrators are using; 2) provide tools to make data reporting and analysis much less time consuming for teachers and school administrators, and 3) to resource a new and deeper level of professional development around data use. In this phase the Superintendents are drawing on the reserves of trust and teacher confidence that have been built up in previous phases to offset concerns about standardizing the data and fears that a large, articulated data set could be used against teachers.

In Phase 4, data are used to locate students or groups of students with achievement problems, but the data also helps educators understand the pattern of the problems so that the problems can be discovered earlier, when remedies may be more effective and less costly.

## **Phase 5: Changing Practise**

The four previous stages have culminated in broad engagement of teachers and school administrators and district administrators, coordinated district-level data support to ensure that the process of collecting, distributing, and analyzing data are done as efficiently as possible. Data analysis does not consume unsupportable time commitments from either principal or teachers. Data are regularly used to pinpoint educational problems experienced by both individual students and groups of students. As a result of this identification schools and districts are able to focus additional resources on those students.

The fifth stage is characterized by the use of data not only to pinpoint where the problems are, but to determine what interventions are made, and to evaluate whether the interventions were successful. The fifth stage also features a distinct deepening of teacher engagement in data use. A district entering the fifth stage will draw on district expertise, school administrator expertise, and teacher engagement to support a system of continuous improvement in which data informs where interventions need to be made, and whether the interventions worked and should be maintained or even expanded. Superintendent Benjamin leads a district on the verge of moving into the fifth stage. "We need to find out whether or not our programs are working. Not whether or not you're teaching them but whether or not the programs are working. They're now becoming more acceptant of that, but we've still got a ways to go on it. But that's a huge barrier."

A district solidly in the fifth stage also uses data to determine the appropriate intervention. While several Superintendents indicated that educators in their districts regularly used data to check to see if the intervention was successful, only one also

suggested that the choice of the intervention itself should be subject to a data based (research) analysis.

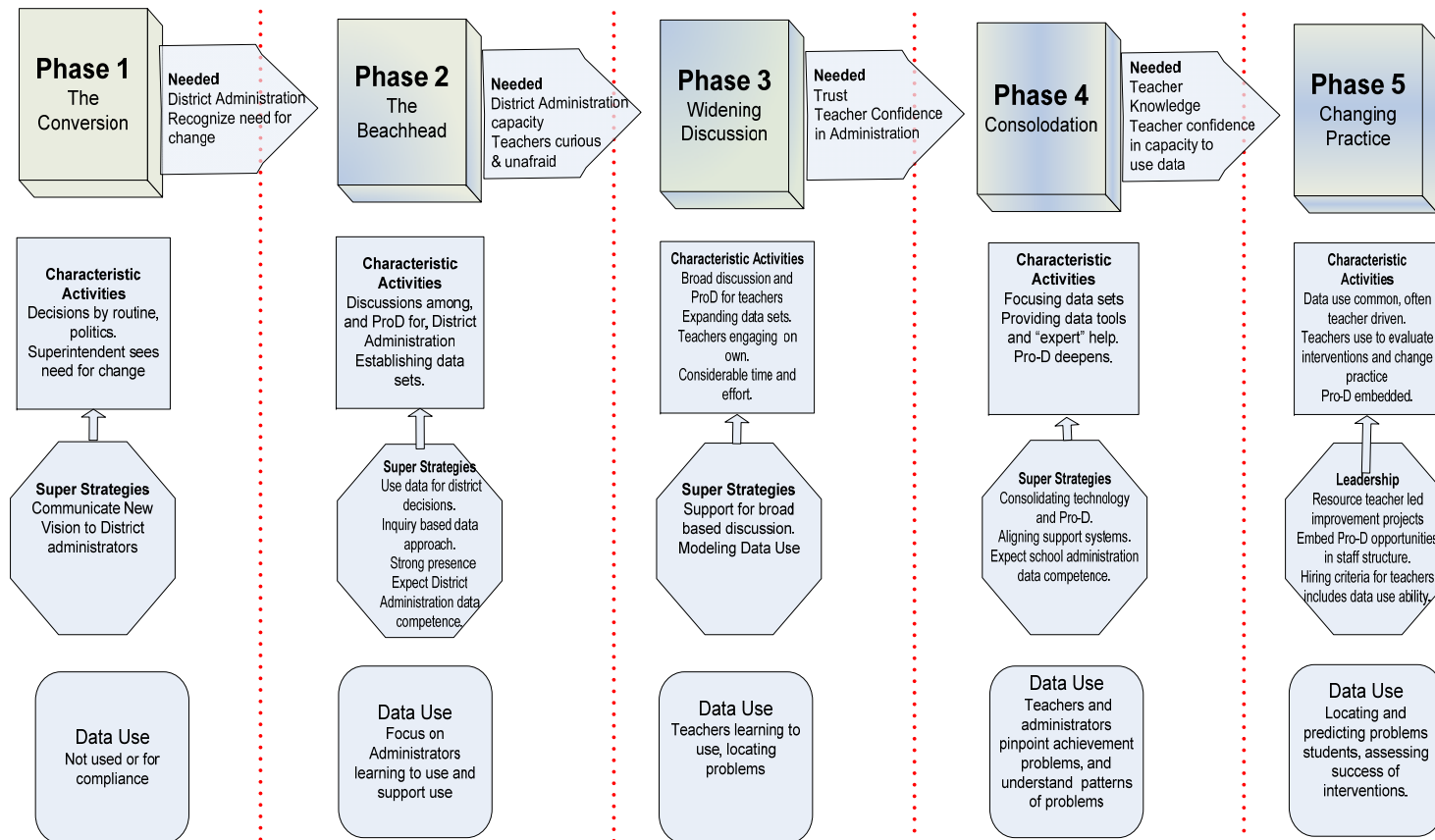
And so the - we're - our plan, and we're partway into now, we've been doing this for about a year now. Is to start to use data, not only to make initial decisions, but to evaluate decisions along the way. And to begin to do-sort of systematically decide whether that intervention is making a difference or not and it's interesting too. If you - I mean, there's a lot of research on, do these things in the classroom and it will make a difference in student achievement. Do these other things and they won't and it's fascinating, because some of the things that don't make a difference, are actually held out by teachers and so on, as things that they think would make a difference (T. Effron).

The fifth stage of data use also features the deepening engagement of teachers in the processes of data use. Superintendent Gumbel described his reaction to teachers taking on the responsibility for testing interventions.

I'm going to step back and let you guys do it because you've now got to the point where you don't need me anymore. And they're doing their own self-assessment to see that, you know, the follow-up piece, which is happening not only for student achievement, but also for teacher engagement in a professional learning activity. So I thought, isn't that cool? So that's part of the culture that's built up over the last six or seven years.

The strategies to support Phase 5 include resourcing teacher-led “action research” that is based on data used to both identify problems, and evaluate the success of solutions, embedding professional development opportunities in the staffing structures, and including as part of the hiring criteria for teachers their skill and comfort in using data.

Data use in this phase is oriented to broad use of data at the district, school, and classroom level to locate students and groups of students who have achievement problems, to develop interventions, and to assess the efficacy of the interventions, in a cycle of continuous improvement.



**Figure 4. Phases of Data Use**

## **Further Considerations from the Literature**

My theory posits that Superintendents manage data-based knowledge through the manipulation of two powerful variables, staff engagement and structural support. The trajectory from non-use of data to a robust program of exploiting data-based knowledge to improve student achievement consists of a series of developmental phases.

The literature has a good deal to say about staff engagement and structural support variables as they apply to organizations generally and to school based leadership specifically. It is, however, very quiet on school Superintendents' roles in the leadership of change, and silent on the specific issue of how Superintendents would lead a change in the domain of data-based knowledge use. I was able to find only a general knowledge management model for that shared some similarities with my theory. This was Parlby's (2000) model of knowledge management stages. As well, several researchers articulated the steps in transforming data into knowledge (Petrides, 2002; Mandinach 2006; O'Brien & Tornak, 2009). These steps could be seen as an early form of a model for this transformation. Finally, some of the literature provided me with insights into what might be an additional phase to my current five-phase framework for a school district's movement along the knowledge management trajectory (Petrides, 2002; William, 2002; Fullan 1997).

### **The Parlby model of knowledge management stages.**

Parlby (2000) presented a "route map" of the five stages of developing a knowledge management system. The stages were 1) Knowledge Chaotic; 2) Knowledge Aware; 3) Knowledge Enabled; 4) Knowledge Managed; and 5) Knowledge Centric. The



beginning stage, Knowledge Chaotic, is characterized by no information sharing and processing. The organization is unaware of the value of systematic knowledge management. This stage is very similar to the first phase that I identified for development of data-based knowledge in school districts. The second stage of Parlbey's route sees an awareness of a need for Knowledge Management (KM), with some KM processes in place, but information sharing is still a problem. The second phase of the school district trajectory also features an awareness of a need for knowledge, but in school districts this phase is also characterized by actions focused primarily on administrators. At this point the focus of the two models diverges. The last three stages of the Parlbey model continue to show a development of utilization of KM, but do not provide detail on the variables that are in play to bring this about. The phases of the school district trajectory attempt to capture not only how data-based knowledge is being used, but the main strategies being used by Superintendents to implement district-wide acceptance of the changes. Furthermore, the phases I set out are developmental. I did not simply take a continuum and segment it into five pieces. I am suggesting that each of the phases I describe are processes that produce an output that is necessary for the next phase to begin.

### **Data to knowledge.**

Mandinach (2006) describes the six essential "cognitive skills" or "actions" associated with moving from data to information to knowledge in a school or school district. The actions for data are to *collect* and *organize*. Information requires *analysis* and *summarization* of the data. Knowledge demands *synthesis* of the information and *prioritization* of decisions derived from the synthesis. This kind of data to knowledge

transition schema would apply to the phases two-five in my framework and would help clarify the activities necessary to make the data useful.

### **Another phase?**

The last phase of the development framework I have proposed is distinguished by widespread, ongoing use of data-based knowledge to identify student performance issues, inform changes to instructional practises, and under gird evaluations of the efficacy of the modified practises. Earl (2006) describes how this becomes a continuous cycle of improvement.

When schools get engaged in a cycle of inquiry and have routine accountability conversations, they find themselves examining their practices with each other and with the broader community - explicitly, publicly, and collectively. This is not a linear process with formal reporting events but is ongoing, nonlinear and iterative, involving reflection, action, and communication. Once it starts any of the activities can be revisited at any time. The school improvement plan becomes a living process with the team collecting, evaluating, and disseminating information all the time to monitor their progress and revisit their priorities (p.108).

A deeply embedded cycle of inquiry as set out by Earl would be welcomed by any of the Superintendents I interviewed. But is there room for school districts to go even further? Petrides and Davenport offer an intriguing possibility with their call for an ecological approach to knowledge management (Petrides, 2002; Davenport et al., 1997). An ecological framework moves beyond the boundary of the Professional Learning Community to “include an external environment that is dissimilar from itself, which adds an intrinsic dimension to the knowledge and learning that occurs within the community as a whole” (Petrides & Guiney, 2002, p.1706). The ecological framework helps guard against simply exchanging the isolation of an individual educator for an isolated group.

Fullan and Fullan & Hargreaves (1996), note "... in a world of growing complexity and rapid change, if we are to bring about significant improvements in teaching and learning within our schools, we must forge strong, open, and interactive connections with communities beyond them" (p. xii).

A phase six added to my framework would underscore the dynamic nature of knowledge use. There is no point of stasis. As the world changes, school districts will be challenged by new demands and expectations from their communities. These challenges will require new knowledge, which will in turn stimulate better questions and the need for better data. The framework begins to take the form of a spiral of knowledge development: new knowledge and new conditions driving new questions which lead to yet more new knowledge that must again adapt to changing conditions.

### **Limitations**

The limitations of a grounded theory project are implicit in the name of the approach. Theory is "grounded" in the data. The theory is meant to apply to the particular substantive area in which it is developed. The substantive area covered by this study is data use of BC school Superintendents. Theory developed through this study may not apply to other education leaders in BC or Superintendents outside of BC unless it is tested and found to fit the data from those situations. Although this is a limitation, it is not a weakness. Glaser and Strauss (Glaser, 1967) considered "modifiability" to be one of the four key measures of the quality of a good grounded theory. "The theory itself should not be written in stone or as a pet, it should be readily modifiable when new data present variations in emergent properties and categories. The theory is neither verified nor thrown out: it is modified to accommodate by integration the new concepts" (Glaser,

1992). That means that as appropriate new situations arise, the categories of the theory can be verified as to whether they still fit the situation and if not, can be adapted or new categories created.

## CHAPTER 6: IMPLICATIONS AND RECOMMENDATIONS

I designed this research project to determine whether a theory could be developed that would be useful to BC School District Superintendents and to the Ministry. By ‘theory’ I mean a generalization about an area of practise that leads to greater understanding of the factors that influence outcomes, and increased ability to predict outcomes (Creswell, 2003; Deming, 1994).

The theory I have proposed is the following: BC School District Superintendents improve the capacity of their district staff to create and use data-based knowledge by combining staff engagement with structural support in such a way that the district advances along a trajectory of increased data use in a series of developmental phases.

I grounded the theory in the narratives, reflections, and suppositions garnered through in-depth, open-ended interviews of 22 BC School District Superintendents in the spring and summer of 2008. After the theory was developed I canvassed the literature on the role of the Superintendent in relation to education change and data-based knowledge management, looking for additional data to help flesh out and contextualize my theory.

The criteria for judging the validity of a ‘grounded theory’ is that it provides the practitioners in the area being studied with additional knowledge and control (Glaser, 1978), offers ‘plausible’ explanation, prediction, or understanding of phenomena (Charmaz, 2006, p.126; Strauss and Corbin, 1994), and be clear enough to be verifiable in future studies (Glaser & Strauss, 1967; Glaser, 1978).

I am guardedly optimistic that my theory will be read by Superintendents (in BC at least) who will find it does provide them with additional and useful knowledge about

increasing their district's capacity to use data-based knowledge. I base this optimism on the high level of interest exhibited by the Superintendents I interviewed (the 22 Superintendents included about a third of the active Superintendents in BC at that time). I propose the theory as "plausible" because it has emerged from close analysis of BC School District Superintendents' own understanding of their situations relating to data use in their districts. Finally, I have included in this section a short proposal for how the theory might be verified and even extended to other educational jurisdictions.

I believe the following are the key implications of my theory for BC School District Superintendents, the BC Ministry of Education, and for future research.

### **Implications for BC School District Superintendents**

#### **Using the theory.**

The theory offers a developmental model that allows Superintendents to position their districts' use of data within one of five phases that range from 'no use' to 'robust use.' The model is a map that can permit assessment of how far a district has come and what possibilities there may be for further development of data-based knowledge. The second function of the model (theory) is to provide Superintendents with an understanding of the activities that are critical to being able to continue to improve the capacity of the district to use data effectively in order to improve or develop its knowledge base. If my theory is valid, Superintendents should follow a specific sequence in developing a district's capacity for data-use to construct knowledge at the organizational level. In other words, the model proposes a lawful sequence in which the

first step determines the second, the second feeds forward into the third, and so on. While a step or phase might be accelerated or abbreviated it cannot be skipped or omitted.

First, the Superintendent should ensure that district administration is well prepared and knowledgeable about using data; the district administration should then broaden preparation to include school based administrators. Finally, when the leadership is prepared, the necessary extension to teachers, other staff, parents and potentially other elements of the community can be implemented. Other points about the sequencing are made in the theory section of this paper.

### **Application of findings.**

The Findings section of the paper contains many stories of data use through which Superintendent readers may confirm their own practises or where they may encounter specific strategies that they can use or adapt.

### **Lessons of knowledge management.**

Superintendents may also find that some of the knowledge management approaches derived from the literature have value and applicability to their districts. A key perspective entails positioning data use within the frame (larger body of theory) of knowledge management. This frame opens a broader understanding of data, and suggests processes to increase its value to school districts. The first insight from the knowledge management frame is that data must go through a transformation, first to information, and then to knowledge before it is fully useful. The transformation is carried out through interpretation. Consequently, data can only become truly useful when it is processed within an environment that supports discussion and engages everyone who is potentially

able to benefit from data use -virtually everyone in the district. This is a very different picture than that of data-driven decision-making, which implies an instrumental process that entertains very little human judgment. I recall Superintendent Elo forcefully declaring "data can't - is not ever going to be the Superintendent." Data, from this point of view, are not a relinquishing of human judgment; they are raw material to be processed into knowledge.

### **Superintendents are central to the change effort: The value of trust.**

The stories from Superintendents that form the core of this paper strongly affirm they are central to any effort to change district processes in order to make full use of data assets. Almost all Superintendents indicated they have spent considerable time modelling data use in decision-making, but more important, being physically present in the schools to lead discussion about why and how to use data-based knowledge. In doing this, the Superintendents are not only modelling data use but also developing personal relationships of trust - a critical element of transformational change. Trust initially operates to alleviate fear that data-based knowledge will be used against staff and later a climate of trust reassures staff that the change will succeed, even during periods of implementation dip. The Superintendent builds this trust personally; it is a product of being present, demonstrating commitment, and practicing leadership with integrity over time.

### **Recommendations for Superintendents**

1. Position District within model. Determine activities needed to move district into next phase.



2. Use the findings sections to generate discussion and ideas about how to improve management and use of data. The quotations from different Superintendents may prove particularly provocative.
3. Consider the development of a knowledge management plan, rather than a data use plan. The Ministry of Education would be a willing partner in this process.
4. Recognize that your leadership is crucial to the success of any data/knowledge management plan. The modelling you do, and the relationships you build will be necessary to overcome the inevitable barriers.
5. Shop at the knowledge store - it's free. One of the richest sources of support and information for Superintendents is the Ministry. The Ministry can provide detailed data sets to the Superintendents and administrators of districts that do not have the resources to organize the data themselves. As districts become more capable and move beyond the use of data-based knowledge simply to identify students and groups of students who may need interventions in order to reach their potentials they will also find in the Ministry a willing partner to pursue methods of using data for evaluation and research

### **Implications for the Ministry of Education: Leadership for a system.**

The Ministry is mandated to supply overall leadership to the education system in BC; it can model data-based knowledge use, build trust, work with Superintendents to supply the necessary technology and data, and support processes that turn data into knowledge.

Since at least 2001 the BC Ministry of Education has pursued the singular vision of improving student achievement. (Of course some would argue that the focus should be on improving student learning, for which current measures of “achievement” may be a proxy or perhaps even a distraction.) The first hope of BC Superintendents is that the Ministry remain resolute in keeping the focus on students. The Ministry, via the Deputy Minister and the Superintendents of Achievement<sup>37</sup> should continue the practise of ensuring that the dominant theme of every meeting with field administrators is student achievement.

As a policy leader in the BC education system, the Ministry can support Superintendents in their efforts to ensure that data are used appropriately and intelligently.

A great concern of Superintendents is a report from the Fraser Institute that annually ranks schools according to the performance of their students in areas such as the Foundation Skills Assessment, provincial exams, and grade-to-grade completion rates.

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<sup>37</sup> The Superintendents of Achievement are field administrators working for the Ministry of Education to help determine where the major achievement issues are and to investigate solutions. As of June 2, 2009 the Ministry employed four Superintendents of Achievement.

During the interviews many Superintendents said that ranking schools generally is unhelpful, and that ranking schools without taking into consideration the socio-economic circumstances of the students is a clear misuse of data. Although the Ministry routinely criticizes the Fraser Institute's school reports, more could be done.

The Ministry should also be able to make access to data/knowledge easier to obtain for all districts. The Ministry could work with Superintendents to determine what phase the district is at and what support could be provided to assist the district. This work is likely best done as part of the development of an overall knowledge management support plan for the Kindergarten—Grade 12 system.

### **Recommendations for the Ministry of Education**

1. Keep the focus on student achievement. The Ministry should continue to communicate and model that the core purpose of the education system is continuous improvement of student achievement.
2. Model and support appropriate data use. The Ministry could consider a strategy such as developing, in conjunction with Superintendents, its own report on how well schools are doing which models best practises in data use.
3. The Ministry could increase the coherency of data use in the education system by setting standards for data quality, and providing guidelines for use.
4. Incorporate the use of data in a knowledge management model which understands data as raw material to be processed into information and knowledge.

5. Inventory the knowledge assets of the BC education system, perhaps starting by cataloguing the various student assessment instruments used in districts.
6. Invest in a professional development initiative to improve the understanding of data use and organizational intelligence by the administrators in the system.
7. Increase district administrators' access to data and technical expertise. For example, the Ministry may be able to provide districts with data relating to the social and economic circumstances of students or data from other jurisdictions such as Statistics Canada, whose data holdings are extensive but difficult to access and interpret, and often costly. The Ministry could also work with district administrators to make the data held in the Education Data Warehouse more accessible to them. The Education Data Warehouse is the largest repository of student level data in the province and if district administrators cannot access it in a useable form they are likely to resort to unnecessary duplication of cost and effort to store the very same data in their own warehouses.
8. Add value to the data: The Ministry could begin to work with Superintendents to move beyond using data simply for monitoring, moving to higher value functions such as evaluating interventions and research designed to provide solutions to the problems. It may be worthwhile for the Ministry to focus less on past results and more on creating future results.
9. The technology that has made sophisticated data collection, storage, analysis, and reporting possible is not available in all districts to the same degree.

Where access to this technology is limited, the Ministry could share its own expertise and technology with the district administrators.

### **IMPLICATIONS FOR FUTURE RESEARCH**

This project originated with an interest in how superintendents used data. I soon discovered that there was little documentation that helped address the question of how Superintendents and data use. The obvious implication is that there is an opportunity for more research to help Superintendents understand how they might address the potential of data-based knowledge in improving student achievement and enhancing the organizational intelligence of BC's school districts, and perhaps more widely in educational organizations in general.

My theory could also be expanded to encompass other jurisdictions. For this to occur, Superintendents in the targeted districts would be selected via theoretical sampling (theoretical sampling is aimed at defining the boundaries and relevance of the main variables, not at statistical selection of populations or groups within populations).

If the focus of additional research was verification, rather than expansion of the theory, the researcher would establish operational definitions of the core variables and the phases, design a tool to measure them, and use some sort of sampling technique on a population to determine if the stages are in fact products of the core variables, and are indeed lawfully sequential.

In the findings section of this dissertation I noted that the most common concept raised by Superintendents in relation to supporting data-based knowledge development was discussion. While it is easy to see that discussion has intrinsic value in that it

necessarily dissolves isolationism, it is not clear how superintendents manage to avoid having discussion substitute for action. Certain types of discussions - those which commit the participants to a decision - can be understood as communicative actions (Habermas, 1984), but it is also possible to have open ended, unresolved discussion. Given the power of discussion to break down isolation, commit participants to action, and even evolve into a broad discourse that sets parameters for discussion (the discussions in the early 1990s about the achievement of Aboriginal students broadened into a discourse that made it almost impossible to discuss student achievement without taking Aboriginal students into consideration), I believe that an exploration of how superintendents manage discussion could yield valuable knowledge about strategies for district-wide reform.

## **AFTERWORD: GROUNDING A GROUNDED THEORY**

This project was intended to develop a mid-level substantive theory aimed at a relatively specific type of organization in a geographically limited area. Having developed a mid-level theory, I would now like to borrow some perspectives from higher-level theory to offer an explanation of why my mid-level theory might work. I will look at several key concepts from Habermas' work, which I believe help explain the importance of data informed discussion, the deep power of culture, and the place of systems (including technology) in a healthy, sustainable organizational environment.

The bundle of concepts I found to be particularly relevant to my theory of data use are Habermas' treatment of Rationality, his elucidation of Lifeworld and System, and his Theory of Communicative Action.

### **Rationality**

Habermas posited two ways to understand rationality. One approach, *purposive* rationality, looks at rationality as an instrumental approach to the world in which one tries to be as effective as possible in manipulating one's environment in order to accomplish one's own ends. Habermas recognized that this form of rationality was necessary, but that it could lead to overemphasis on domination both of the natural world and of people (Eriksen & Weigard, p.2). It needed to be complemented with another form, which he called *communicative* rationality. This form is based on the subject to subject relationships of communicating individuals. It is procedural, specifying the processes necessary to legitimize knowledge and coordinate action. To Habermas, the balance of purposive and communicative rationality was preferable to non-rational

approaches, such as intuition and emotions, as a means of generating knowledge and determining actions (Eriksen & Weigard).

The preference of rational to non-rational basis for actions (such as decision making) is implicit in and important to my theory. The use of data, information and knowledge to improve student achievement is considered an improvement over routine, politics, “feelings”, and serendipity. The movement along the phases is clearly a movement toward expanding the breadth and depth of data use as a rational approach to improve student achievement. The approach incorporates the purposive form of rationality by emphasising facts about student performance and knowledge devoted to securing practical strategies for action. It also incorporates communicative rationality with the emphasis on broad discourse to engage school staffs in strategies to use data as a tool for improving student achievement.

### **System and Lifeworld**

Although communicative rationality is critical to engagement of staff in strategies and actions for improvement, it is also clear that not every interaction can be discussed. If this were necessary “the communication medium would soon be overloaded and show itself to be unsuitable for coordination purposes” (Eriksen & Weigard, p.47). Habermas describes two mechanisms which work together to manage the amount of discussion needed to coordinate action: system and lifeworld.

“System” to Habermas, refers to a set of “self regulating subsystems which are mutually dependent on each other, and which regard each other as their environment... the real and long-term results of actions, which help maintain the system may be both



unintentional and not acknowledged by those who execute them” (Eriksen & Weigard, p.90). Systems operate independently of the intentions of the individuals in them. According to Habermas, systems are guided, or steered, by money (specifically the market economy) and power (specifically the political-administrative apparatus). The purpose of the systems is to “represent an ordering structure in an otherwise chaotic world: they reduce the complexity of the action environment” (p.90). In a school district, “system” is represented by many activities based on administrative and/or legal procedures; timetabling, class size and composition, curriculum, standardized testing, hours of work, days of instruction, and transportation. Included in this group are the technological systems that support data gathering and use. These systems are clearly critical to the effective operation of the school districts.

Habermas says that although systems are necessary for society to operate efficiently, they must be balanced by the lifeworld, a "Reservoir of taken-for-granted and shared knowledge that we as members of a society all have part of, and which ensures that we see many things in more or less the same way" (Eriksen & Weigard, p.47). The lifeworld has three structural components: culture, society, and personality, all of which depend on language for their reproduction. The cultural reproduction process functions to provide new knowledge that is able to fit into existing interpretative frameworks, while the social integration function keeps society together by legitimizing interpersonal relationships. The socialization function ensures that personalities are developed that can work in society. The lifeworld contains the set of interpretive patterns that people draw on in day to day living and it is through the human relations in lifeworld that system is legitimated (p.94). Lifeworld also acts to help reduce the complexity of the environment.

It contains the “stock” of knowledge, social relations, and socialization that we are rarely aware of, but always draw on when we interpret the world. Thus we are always within the lifeworld. “We cannot decide to set it aside, disregarded or remain generally critical to it. When we interpret the world, it is always on the basis of preconceived convictions that the lifeworld supplies us with” (Eriksen & Weigard, p.47). The strength of the lifeworld will determine for a society, and by extension, for an organization, “how rational the transmission of knowledge is, how strong the solidarity of the members gets, and how responsible the new personalities are” (Eriksen & Weigard, p.89). The organizational attributes of knowledge transfer, staff engagement and personal commitment are closely aligned to the processes of the lifeworld.

Habermas considers both lifeworld and system to be necessary. Lifeworld establishes the fundamental human motivations upon which system is able to operate; lifeworld in itself cannot deal with the full complexity of society. "System should not be seen to be of lesser value than lifeworld; it is essential to the smooth operation of society. As long as the purposive-rational attitude is limited to those areas concerned with material production, such as the economy and administration, there is no real danger to lifeworld. Indeed, within these areas rationality is essential for efficiency” (Eriksen & Weigard, p.101). System, viewed as necessary for society, is also a crucial aspect of organizational functioning. The policies and procedures which direct most of the specific functions of the organization are not functions of lifeworld; they are products of administrative systems, such as wages and benefits, personnel, information management, and operational procedures. If these systems are ineffective the organization will be

distracted from its purposes and will have its resources consumed by non-productive activities.

### **Communicative Action**

Habermas' theory of communicative action casts light on the vital role of discourse in decision making, engagement, and change. Communicative action involves two or more people using language to achieve the mutual understanding of a specific action situation so that they can coordinate their actions. The claims they make, and the intention to meet them with arguments, gives language power to coordinate action.

Communicative actions are rooted in rationality. Communicative rationality is primarily procedural, in a sense that the conclusions and agreements are less important than the manner in which they are obtained. "...there is no a priori blueprint for the best solutions, the issue has to be decided through a deliberate process, where all the involved parties have the same fundamental right to have their voices heard" (Eriksen & Weigard p.6). In practise this means that no position can be right forever, it is always subject to challenge by better arguments.

The reason communicative action is so important is that it carries with it moral power - the potential to direct behaviour without coercion or manipulation. The basis of moral authority is found in the act of discourse itself. To engage in discourse means that participants have implicitly agreed to make and challenge claims until all are satisfied that the best decisions have been made. They are then rationally committed to carrying out the decisions.

The theory of communicative action underscores the importance Superintendents attribute to engaging staff in discussion of data use. If discussion can lead to agreement about the value of data use, and of how it will be used, the moral authority of the agreement draws the participants together in mutual engagement.

Lifeworld, System, and Communicative Action together provide a balance which allows organizations to accomplish their purposes by drawing on shared motivations and interpretations of staff, implementing systems to ensure efficient operations, and engaging in Communicative Action (discussion) to deeply engage staff in change.

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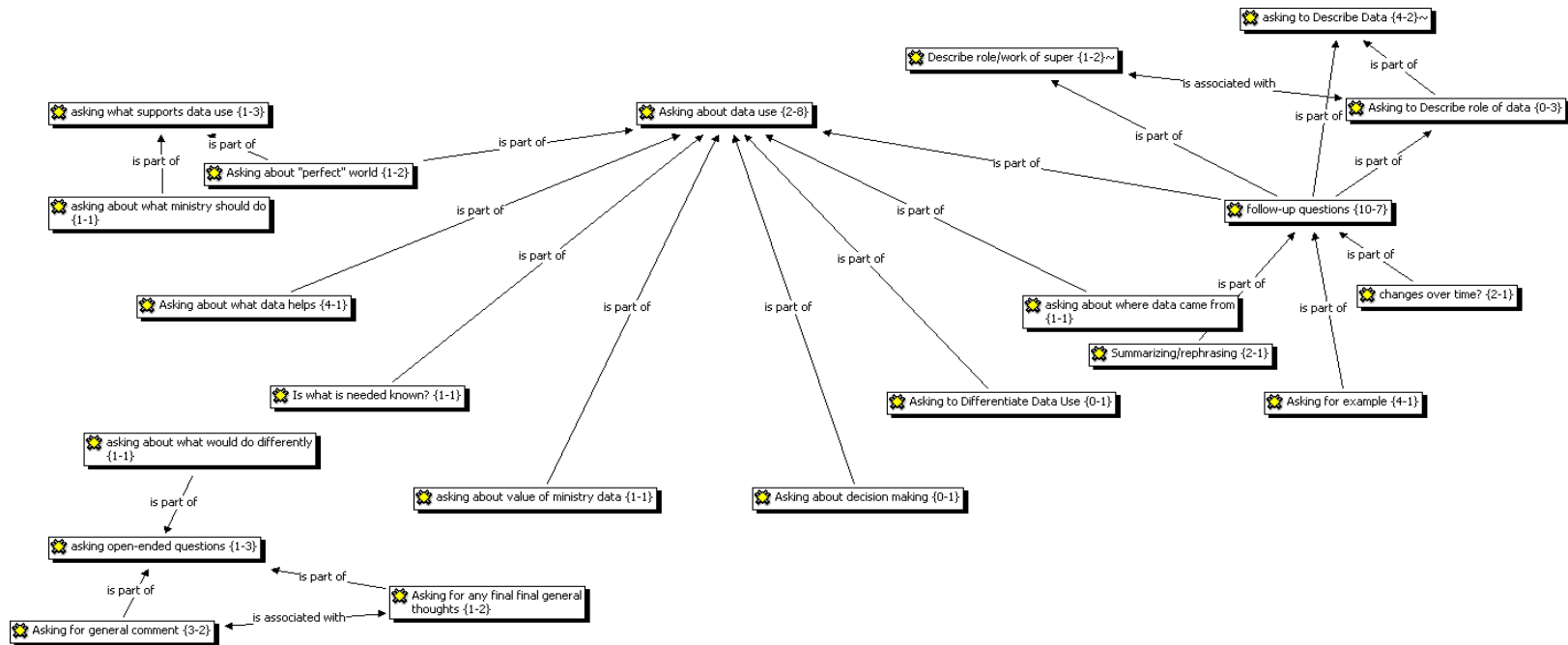
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## APPENDICES

### Appendix A: Interview Reference Guide:



My interviews open ended, started with the question, “What do you consider the role of the Super intent to be?” From then on I simply followed the path the conversation opened up. After several interviews I noted that even though the conversation threads varied, familiar concepts and topics kept emerging. They became the elements of the graphic that follows. I then used the graphic as a kind of compass during the interviews, to check from time to time to get my bearings.