

2013-07-15

Decision Making across a Newfoundland School District

Warren, Wilson Douglas

Warren, W. D. (2013). Decision Making across a Newfoundland School District (Doctoral thesis, University of Calgary, Calgary, Canada). Retrieved from <https://prism.ucalgary.ca>. doi:10.11575/PRISM/25527
<http://hdl.handle.net/11023/818>

Downloaded from PRISM Repository, University of Calgary

UNIVERSITY OF CALGARY

Decision Making across a Newfoundland School District

by

Wilson D. Warren

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF EDUCATION

GRADUATE DIVISION OF EDUCATIONAL RESEARCH

CALGARY, ALBERTA

JULY, 2013

©Wilson D. Warren 2013

Abstract

This qualitative research study presents descriptive and explanatory multiple case analyses offering a description and analysis on relational decision making among school district leaders responding to a district wide videoconferencing policy. This exploratory study was conducted using an interpretive mixed method multiple case approach. Interviews and document analyses were the primary data sources used to collect data. Eleven rural principals, five urban principals and five district administrators were interviewed using a semi-structured interview guide. Network analysis, Bates ACTIONS model (2000) and Brazer & Keller (2006) multiple stakeholder decision making models formed the conceptual framework for the data collected. The range of documents included annual reports, board meeting minutes and policy drafting. Triangulation of the data (Patton, 2002) contributed to the validity and credibility of the data analysis. Among the leaders studied, the network formed as a know-how network of influence. The rural leaders' network emerged as an inflexible thin network where information exchange limited network capacity. The urban and district leaders' network emerged as a dense tightly closed network. For rural leaders, learner impact from the videoconferencing influenced decision makers most. Cost influenced urban decision makers most. The district leaders considered organizational impact as their most important decision making factor. Instructional and curriculum decisions were the top decision making task for rural leaders. Strategic resourcing was the top decision making task for urban leaders. The district leaders ranked centralized and decentralized decision making as their top ranked decision making task. Rural leaders used student learning, school process and perception data to guide their decision making with implementation. The urban leaders used solely student learning data.

The district leaders used student learning and school process data. Rural leaders used type 2 and type 3 collaborative decision making style within staff meeting and school council structure. Urban leaders used type 2 and type 4 collaborative decision making style within a committee structure. District leaders used type 1, type 2 and type 4 collaborative decision making style within a committee structure when involving others in shared leadership.

Acknowledgements

I express my thanks to those who have encouraged, supported and advised me in my doctoral studies.

I extend my deepest thanks to Dr. Eugene Kowch, who has been my supervisor and friend, for his guidance and encouragement. I could not have completed this journey without his patience, wisdom, and insight all the while keeping me focused when difficult challenges arose.

I am immensely grateful to the members of my supervisory committee: Dr. Jacobson, Dr. Ottman and Dr. Kowch. They were fair and encouraging in all aspect of my doctoral work.

Finally words cannot express the debt I owe to my incredible family. This work grew out of the sacrifices made by them. My mother, Hannah Jane Warren, for always believing in me and showing me the power of unconditional love. My in-laws, Mary and Jim, for welcoming me into their home and family and always being supportive of my dreams. My wife, Tina, who patiently provided encouragement and support that enabled me to pursue my educational goals, for being with me every step of the way and motivating me to be the best in everything that I do. She has always been my greatest cheerleader and friend always keeping the faith that I would succeed. She is simply the love of my life. My daughter, Chloe, for truly showing me what is most important in life and making me believe in angels. My two sons, James and John, for allowing daddy the time he needed to complete this journey. My kids are my inspiration.

Dedication

This dissertation is offered in memory of my father, John Henry Warren, for his efforts in teaching me to be strong and determined. He showed me that you don't always have to be the leader to lead by example. He always told me how proud he was of me, when in truth, I was most proud of who he was.

I felt his presence many times throughout this journey. I just want to say: Daddy, you can let go of my hand now. Your son has finally finished.

Table of Contents

Abstract.....	ii
Acknowledgements.....	iv
Dedication.....	v
Table of Contents.....	vi
List of Tables.....	xiv
List of Figures.....	xvi
Chapter 1.....	1
Introduction.....	1
Rationale for the Study.....	3
Context for the Study Topic.....	6
Significance of the Study.....	10
Organization of the Chapters.....	13
Chapter 2: Literature Review.....	15
Organization of the Literature Review Chapter.....	15
Background to the Study.....	16
Educational Leadership.....	16
The Role of the District in Educational Change.....	20
Principalship.....	22
The Role of the Principal in Educational Change.....	26
Organizational Change and Leadership.....	29
Fullan’s Educational Change.....	31

Decision Making.....	33
The Classic or Traditional Model.....	34
The Incremental Model	35
Mixed Scanning Model	36
Social Judgment Model.....	38
Pettigrew’s Decision Making Framework.....	39
ACTIONS Model	40
Multiple Stakeholder Decision Making Model	41
Collaborative Decision Making.....	45
Organizational Learning	51
Data Driven Decision Making.....	52
Social Networks.....	56
Agents of Socialization.....	59
Relations	63
Medium for Maintaining Relations	64
Network Analysis Techniques.....	66
Rationale for using Social Network Analysis.....	69
Dyadic Data Analysis	72
Technology as a Change Issue.....	73
Conceptual Framework.....	77
Chapter 3: Research Methodology.....	81
Research Methods.....	81

Epistemological and Ontological.....	83
Case Study Approach.....	83
Mixed Methods Research	85
Participant Recruitment: Sample Selection	86
Emergence of the 3 Cases: Rural, Urban, and District Leaders/ Decision Makers	88
Participant Profiles.....	90
Data Collection	92
Truthfulness	95
Reliability.....	96
Data Analyses	97
Data Coding	99
Coding for ACTIONS: Factors influencing the Decision Making	99
Coding for the Brazer and Keller Educational Decision Making	102
Limitations.....	105
Delimitations	106
Ethics and Confidentiality	107
Chapter 4: Research Findings	109
Introduction to the Findings	109
Structure of the Case Study Narratives.....	110
The Rural Leader Decision Making Network	111
The Rural Leader Case	111

Background.....	111
Description of Rural Leaders’ Decision Making Network.....	114
Network Relationships	115
Structural Features	115
Degree Centrality.....	116
Betweenness Centrality	118
Closeness Centrality	119
The Rural Leader Decision Making Network Centralization.....	120
Density.....	121
The Nature of the Rural Leader Decision Making Network	122
Rural Leaders Choices for Establishing their Network Ties	124
Decision Making Process Factors (Bates, 2000): Rural Leaders	125
Factors influencing Rural Leader Decision Makers	126
Impact on Learners	127
Access by Learners.....	129
Costs	132
Type and Content of the Rural Leader Decision Making (Brazer & Keller, 2006).....	133
Content of Decision Making.....	133
Planning, Coordinating and Evaluating Instruction and Curriculum.....	134
Establishing Goals and Expectations.....	135
Promoting and Participating in Learning and Development	138
Types of Data used in Decision Making	139

Role of the Participants.....	143
Structure and Types of Collaboration.....	147
Capacity Building through Collaboration.....	155
Reflections on the Rural Leaders Case Study.....	157
The Urban Leaders Decision Making Network.....	158
The Urban Leader Case	158
Background.....	159
Description of Urban Leaders’ Decision Making Network.....	160
Network Relationships.....	161
Structural Features	161
Degree Centrality.....	162
Betweenness Centrality	162
Closeness Centrality	162
The Urban Leaders Decision Making Network Centralization.....	163
Density.....	163
The Nature of the Urban Leader Decision Making Network	164
Urban Leader Choices for Establishing their Network Ties.....	166
Decision Making Process Factors (Bates, 2000): Urban Leaders	167
Factors influencing Urban Principal Decision Makers.....	169
Cost.....	170
Impact on Learners	171
Type and Content of the Urban Leader Decision Making Network (Brazer & Keller, 2006).....	173

Content of Decision Making.....	173
Strategic Resourcing.....	174
Planning, Coordinating and Evaluating Instruction & Curriculum.....	176
Promoting and Participating in Learning and Development	177
Types of Data used in Decision Making	178
Role of the Participants.....	180
Structure and Type of Collaboration	181
Reflections on the Urban Leaders’ Case Study	184
Description of District Leaders Decision Making Network	185
The District Leader Case	185
Background.....	186
The District Leaders’ Decision Making Network	187
Network Relationships	188
Structural Features.....	188
Degree Centrality.....	188
Betweenness Centrality	189
Closeness Centrality	189
The District Leader Decision Making Network Centralization	189
Density.....	190
The Nature of the District Leaders Decision Making Network.....	191
District Administrators’ Choices for Establishing their Network Ties	192
Decision Making Process Factors (Bates, 2000): District Leaders	193

Factors influencing District Leaders’ Decision Makers	195
Organizational Impact	196
Costs	197
Impact on Learners	198
Type and Content of the District Leaders’ Decision Making (Brazer & Keller, 2006).....	199
Content of Decision Making.....	199
Centralized/Decentralized Decision Making.....	200
Strategic Resourcing.....	201
Promoting and Participating in Learning and Development	202
Types of Data used in Decision Making	202
Role of the Participants.....	206
Structure and Type of Collaboration	210
Capacity Building through Collaboration	212
Reflections on District Leaders’ Case Study	215
District-Wide Decision Making Network.....	216
Network Relationships.....	216
Relations	219
Structural Features	220
Degree Centrality.....	220
Betweenness Centrality	222
Closeness Centrality	223
Network Centralization	223

Density.....	224
Chapter Summary	225
Chapter 5: Analysis and Implications.....	228
Introduction	228
Answers to the Research Questions.....	228
Chapter Summary	244
Chapter 6: Conclusion and Implications.....	247
Introduction	247
Conclusion.....	247
Implications of this Research and Contribution to Scholarly Study	248
Practitioners.....	248
Leaders	249
Scholars	251
Implications for Future Research	252
Recommendations	252
Summary.....	255
References.....	257
Appendix I: Terms and Definitions Informing this Study.....	287

List of Tables

Table 1.0. Leadership Theories and Models.....	79
Table 2.0. District, Urban and Rural Participant Profile	91
Table 3.0. The Bates ACTIONS model, 2000).....	101
Table 4.0. Examples of Coding (Bates ACTIONS Model, 2000)	101
Table 5.0. Multiple Stakeholder Decision Making Model (Brazer & Keller, 2006).....	103
Table 6.0. Examples of Coding/Multiple Stakeholder Decision Making Model (Brazer & Keller, 2006).....	105
Table 7.0. Rural Leader Decision Making Network Structural Features	115
Table 8.0. Functions served by Rural Leader’s Decision Making Network.....	122
Table 9.0. Reasons given by Rural Leader for Establishing their Network Ties	125
Table 10.0. Decision Making (ACTIONS) Parameters for Rural Leaders (Bates, 2000).....	127
Table 11.0. Content of Decisions made by Rural Leaders (Brazer & Keller, 2006).....	134
Table 12.0. Types of Data used by Rural Principals (Brazer & Keller, 2006)	139
Table 13.0. Summary of Rural Leaders Case Findings	157
Table 14.0. Urban Leader Decision Making Network Structural Features	161
Table 15.0. Functions served by Urban Leaders’ Decision Making Network	164
Table 16.0. Reasons given by Urban Leaders for establishing their Network Ties.....	167
Table 17.0 Decision Making (ACTIONS) Parameters Bates (2000): Urban Leader	170
Table 18.0. Content of Decisions made by Urban Leaders (Brazer & Keller, 2006).....	174

Table 19.0. Types of Data used by Urban Leaders (Brazer & Keller, 2006)	179
Table 20.0 Summary of Urban Leaders' Case Findings.....	184
Table 21.0. District Leader Decision Making Network Structural Features	188
Table 22.0. Function served by District Leader's Decision Making Network	191
Table 23.0. Reasons by District Leaders for establishing their Network Ties	193
Table 24.0. Decision Making (ACTIONS) Parameters Bates (2000): District Leader	195
Table 25.0. Content of Decisions made by District Leaders	199
Table 26.0. Types of Data used by District Leaders (Brazer & Keller, 2006)	202
Table 27.0. Summary of District Leaders Case Findings	215
Table 28.0. District wide Leader Decision Making Structural Features	220
Table 29.0. Summary of Responses.....	226

List of Figures

Figure 1.0 Pettigrew's (1985) decision making framework	39
Figure 2.0 A general conceptual framework for educational decision making by Brazer & Keller (2006)	42
Figure 3.0 Nova central school district geographical boundary	90
Figure 4.0 Geography and travel limitations	107
Figure 5.0 Network of rural decision makers	114
Figure 6.0 Network of urban decision makers.....	161
Figure 7.0 Network of district administrator decision makers	187
Figure 8.0 Network of principals and district administrators mapped together	218

Chapter 1:

Introduction

While educational scholars throughout the world acknowledge the importance of interpersonal relationships and social interactions for continuous school improvement and organizational change (Carmichael et al., 2006; Hopkins & Reynolds, 2001; James et al., 2007; Moolenaar et al., 2009b), knowledge about the decision making structures in which policy implementation take place is scarce. Findings from organizational literature indicate that organizational improvement is closely linked to the ties within and across system (McGrath & Krackhardt, 2003; Tenkasi & Chesmore, 2003). Recent research has suggested that social and other structures provide opportunities for communication, information transfer and development of new knowledge between individuals, levels and units within organizations (Kowch, 2013; Ahuja, 2002; Tsai & Ghoshal, 1998). To date, there is little empirical understanding of how the underlying relational networks among leaders engaged in, district wide change efforts support or constrain school change efforts or even new policy implementation (Coburn & Russell, 2008). A more in-depth investigation of the social relational networks among leaders within and among district schools, particularly among decision making administrators can uncover important characteristics of those social structures and processes that happen within them, informing us about structures that facilitate or impede efforts at making decisions on a system wide policy implementation.

Organizational learning research finds that capturing and transferring complex knowledge is aided by robust leader networks. But many barriers in leader networks often prevent individuals from finding and absorbing useful knowledge from one another (Cross,

Borgatti & Parker, 2002; Cross & Parker, 2004; Reagans & McEvily, 2003). Relational networks have, for example been studied to explain how leaders organize interests and the capacity to lead organizations so that so we can better understand more about dynamics among leaders and who “chooses” or negotiates enactments among a set of interests and influences shared with others (Atkinson & Coleman, 1996; Kowch, 2003). Modified policy network theory (Kowch, 2008; 2013) for example finds that leaders attract around issues or policies to coalesce and form action networks from a possibly disconnected constellation of roles (i.e., principals in different schools). These kinds of leader networks form an active constellation of people with shared interests and shared influence for purposeful work (Kowch, 2003; 2005; 2009). Recently, various policy initiatives have shifted the mandates of school districts’ so that they provide more active, supporting roles for organizational learning and leader development in terms of change, suggesting that school districts should more actively foster professional networks among leaders in order to retain and spread valuable organizational knowledge that would aid in effective decision making (Honig, 2008). Beyond using the convenient metaphor of “networks” to indicate “collaboration”, little is known about the features and dynamics of the more informal networks emerging among school leaders or about the extent to which these relations connect leaders in ways that facilitate learning. Examining the structure of school leader networks can assist leaders in better managing and understanding patterns of interactions in support of decision making to meet specific targeted organizational goals (Ahuja, 2000; Tsai & Ghoshal, 1998). A study of decision making networking among leaders is of interest to contemporary central office administrators, school principals, and researchers who are interested in effective

decision making in response to a district wide policy. This research study offers a fine grained *description* and *analysis* of how leaders manage the dimension of decision making and the relationship of their behaviors to the decision making process at the rural, urban and district leader levels.

The purpose of this study is to contribute to the knowledge of decision making among school district leaders who respond to a district wide videoconferencing policy. The study was conducted during the months of January, February, March, April and May, 2009, in one Newfoundland school district that was implementing a district wide videoconferencing policy. The findings of this case study may be generalizable to theoretical propositions and similar contexts of district leaders making pan-institutional decisions, but not to populations (Yin, 2003).

Rationale for the Study

From reviewing the literature, it is unclear whether or not practitioners understand the decision-making network that exists within the school environment. Specifically, from whom do principals and district administrators seek input and opinions before or while making key decisions? Decisions are not made in isolation—a social network and network of influence affecting all decisions are made by systems of variously connected principals, not just by people in job junctions. For example, decision making networks may be a genesis for information exchange, knowledge transfer, and for sharing advice. We need to know more about the decision making being done in those network structures.

Traditionally, the content that flows through relationships defines the purpose of the network and how well the resources flow between actors (Wasserman & Faust, 1998).

Relational studies of decision making leaders often ask: Who is highly influential when important decisions are made in education?

The primary purpose of this research is to look closely at how the leaders across a school system respond to a system wide policy intervention in order to learn something about how those relations shape decision making. Some research has been done on models of decision-making researching to the role of the administrator (Kefford, 1994), but a gap in our knowledge about principal decision making across districts for example exists when we attempt to explore the *nature* and *type* of decision-making relational networks that administrators engage or create when they respond to district wide policy interventions. This is even more critical in contemporary school leadership because school districts are increasingly seen as learning organizations while they continue to get larger and more complex with respect to leader relation in an ever-changing state.

A good example is the *Newfoundland school system*. The number of school districts in the province of Newfoundland and Labrador (excluding the Francophone District) has been reduced from twenty seven to ten, to four, and now to one, within the past seventeen years. Many changes in administration at the district level have resulted in significant increases to the administrative functions which must now be carried out at the school level. Beginning September 2013, the province of Newfoundland and Labrador with a total land area of 405,720 km^2 (which is more than three times the total area of all three of the Maritime provinces combined) will have two provincial schools boards-one English language board and one French-language board. This school system size is expanding and leaders need to know more about leading and decision making in these more distributed,

larger and complex systems (Davis & Sumara, 2006). Understanding the decision making networks of such large complex organizations in implementing policy will be critical to successful district wide change. Leaders of such organizations will be required to respond to many change forces with the aid of modern communications and digital learning technologies that allow people to connect quickly and powerfully over space and time. Too familiar with bureaucratic and hierarchical realities in organization life that were common before such connective technologies, leaders today feel pressure from the new, incredible connectivities offered and they must learn to lead within these complex systems, not just to manage parts of the organization (Oblensky, 2010). Tied together both tightly and loosely by communication networks, the leaders of today's organizations have responded to public and employee demands for less rigid organization models aware of the new relational context of organizations (Forno & Merlone, 2007). We need to expand our leadership thinking and diversify our perceptions of the organization well beyond a set of nested structures where specialization work occurs in linear box or "organization flowchart" patterns (Kowch, 2008). This study adds new knowledge on relational decision making for such leadership.

In this context, network theory is well paired for describing the features of relations (links) and nodes (people) in both interpretive and quantitative approaches (Scott, 2013, p. 4). Network theory allows this researcher to see how the key decision makers organize and connect and determine how strong that system is. Social networks are maps that commonly identifies who contacts whom (Wasserman, 2005; Granovetter, 1973), whereas policy networks are maps identifying shared interests and the organization of those interests as

collections of lines and nodes in patterns. Network theory helps us describe and interpret complex webs of changing relationships with powerful computer models and some basic rules. Considering the changing dynamics of the school district organization, this researcher used network theory to trace the decision making network of the administrators as they worked through implementing a district wide videoconferencing policy. By studying organization members, patterns of relations and the work of organizing interests we study systemic change at micro, meso and macro levels. Role functions and hierarchical models are not the best way to understand how work really gets done in changing (not static) organizations (Stacey, 2009; Kowch, 2005). This research attempts to describe and interpret the relational features (links) of people (nodes) who self-identified each other as people who mattered in the decision making regarding implementing of the district wide policy. The rationale for this study comes from recognizing the increasingly complex nature of ever-consolidating and changing school districts along with strong calls for more knowledge to help us lead those kinds of systems in this country (Levin, 2011).

Context for the Study Topic

To better understand the context in which contemporary schools operate, a number of scholars have shifted their focus from the school site as the unit of the change effort to the relationship between district office and school sites (Elmore & Burney, 1997; Hightower et al., 2002; Honig, 2006; McLaughlin & Talbert, 2003; Rorrer et al., 2008; Togneri & Anderson, 2003). This line of inquiry acknowledges that schools are embedded within a larger context and that this context may have a direct impact on the implementation of change efforts (Copland & Knapp, 2006; Massell & Goertz, 1999;

Rorrer et al., 2008; Spillane, 1996). One approach to implementing change efforts is a system-wide approach (Honig & Hatch, 2004), in which district administrators reorient organizational structures and processes to align with the change effort goals (Rorrer et al., 2008). This reorientation, Datnow & Castellano (2003) argue, creates “supportive conditions at the district level that are important to successful implementation and sustainability of whole district change effort” (p. 203).

Therefore, successful implementation of policy may require a shift in the way that change strategies are enacted within a school district. This shift involves a move from a singular focus on individualized segments of the organization to engaging the entire system in a network of connections. The significance of collaborative structures and leader networks for successfully implementing change is underlined by studies on educational reform and school change across the globe, such as Southeast Asia (Hallinger, 1998), Australia (Hollingsworth, 2004), the Netherlands (Moolenaar et al., 2009a, b), Portugal (Lima, 2009), Uganda (Hite et al., 2006), the UK (Durrant & Holden, 2006; Earl & Katz, 2007; Hargreaves, 2003) and the USA (Daly & Finnigan, 2009). These studies showed that social context, and in particular social interaction among the school leaders, is believed to be at the heart of successful whole school change efforts. Studies of successful districts that applied more systemic approaches in implementing school change suggest a range of specific strategies that leaders can engage in to build stronger organizational ties (Chrispeels, 2004; Honig, 2004; Tongeri & Anderson, 2003). These strategies include creating structures for increased collaboration and knowledge exchange within schools (McLaughlin & Talbert, 2003); enhancing communication channels and support (Agullard

& Goughnour, 2006); sharing leadership (Leithwood et al., 2007; Spillane, 2006); and providing opportunities for input on decision making (Brazer & Keller, 2008). All of these strategies collectively are important components of the decision making process for leaders in implementing school change (Brazer & Keller, 2008).

School districts are clearly complex organizations. Traditional, hierarchical values of leadership are less and less useful given the complexities of these organizations. Leadership theory must therefore transition to new perspectives that account for the complex adaptive needs of such organizations. Leadership has become a dynamic product of interaction and exchange rules governing changes in perceptions and understandings. In such systems, relationships are not primarily defined hierarchically, as they are in bureaucratic systems, but rather by interaction among heterogeneous agents and across agent networks (Lichtenstein et al., 2006). A complexity view suggests leadership that does not lie in a person but rather in an interactive dynamic, within which any particular person will participate as leaders or a follower at different times and for different purposes. It is not limited to a formal managerial role, but rather emerges in the systemic interactions between heterogeneous agents (Marion & Uhl-Bien, 2003).

A key contribution of a complexity leadership theory is that it provides an integrative theoretical framework for explaining interactive dynamics that have been acknowledged by a variety of emerging leadership theories such as shared leadership (Pearce & Conger, 2003), distributed leadership (Gronn, 2003), relational leadership (Drath, 2001), and adaptive leadership (Linsky & Heifetz, 2002). Similarly, by framing

leadership as emergent, it can be usefully explored from both the interpretivist and the functionalist traditions of organizational analysis (Burrell & Morgan, 2003).

School districts have a large number of employees with a complex division of labor and are divided into multiple loosely coupled and geographically dispersed units (Weicks, 1976). Having an awareness of all the possible sources of useful knowledge would be impossible for individual leaders, so leaders are likely to “satisfice” by operating with only a partial sense of who knows what in the district. This in turn can limit the effective flow of information and hinder maximizing organizational learning. This negatively impacts the ability of the leaders to make well informed effective decision making. The difficulties involved in successfully seeking input into decisions throughout a school district are compounded by two factors: (1) increased organizational complexity, and (2) a lack of clarity in the knowledge needed. Information barriers increase as organizations become more complex in term of size and multi-dimensional structure. Employees may have useful knowledge and skills to offer one another, but organizational complexity compounds the lack of awareness or social contact needed to convey the information (Tsai, 2001). This study is one of the first to examine leader relations in such complex systems as school districts.

As will be shown in this study, network structures may facilitate the transfer of resources if the necessary relationships are in place and are accessible, but they may also constrain resource exchanges if the network does not hold sufficient connected ties to move the resource (Daly & Finnigan, 2009; Hite et al., 2005). In many cases, the underlying social structure determines the type, access, and flow of resources to actors in the network.

Therefore, understanding network structures may be useful for educational organizations implementing policy as these underlying networks may be leveraged to better create, use and diffuse knowledge critical for effective decision making across an organization (Cross et al., 2003).

There has been little written in the literature on the decision-making network approach as it pertains to the role of the administrator, and even less focuses on responses of school administrators to situations where there is a system wide policy intervention. A better understanding of the decision process for administrators in school districts has important implications for the leaders who are responsible for such organizations, particularly those who deal with policy implementation. This research generated a deeper understanding of the decision process at work for school district administrators. The research adds descriptive data to the knowledge bank for researchers exploring the decision making network of school administrators in responding to organizational change. The problem is significant because understanding the development of decision making network relationships of its employees has value for an organization as well as for an individual (Cross & Parker, 2004, p. vii). This qualitative case approach research determined several factors that were important to the participating district administrator decision makers in responding to a district wide policy initiative.

Significance of the Study

A significant void exists regarding our knowledge of fundamental decision making for contemporary leaders dealing with a change initiative such as implementing a district wide policy (Leithwood, Louis, Anderson & Wahlstrom, 2004). A sound understanding of

decision making as it relates to dealing with a policy initiative is sought in this study and is intended to complement the body of knowledge on leadership that currently exists and expand the knowledge base of school leaders.

There seems little doubt that both district and school leadership provides a critical bridge between most educational policies and having those policies make a genuine difference for all students. Such leadership comes from many sources, not just district administrators and principals. But those in formal positions of authority in school systems are likely still the most influential. Efforts to improve their ongoing development should be considered effective approaches to successful school improvement. These efforts will be increasingly productive as research provides us with more understanding of how successful leaders make sense of and productively respond to both policy initiatives and local needs and priorities (Leithwood, Louis, Anderson & Wahlstrom, 2004). Such efforts will also benefit considerably from more fine-grained understandings that we currently have of successful leadership practices such as decision making in implementing those policies in different local contexts (Leithwood, Louis, Anderson & Wahlstrom, 2004). This study is of interest to central office administrators, school principals, and researchers who are interested in effective decision making in response to implementing a district wide policy. This research also has implications for school districts seeking to better capture and transfer important organizational leadership knowledge and skills. Implications and recommendations are offered for leadership, policy and practice in understanding the decision making process involved in the implementation of a district wide policy.

Research has shown that exploring the network interactions within a school district at all levels of the organization may facilitate the effective exchange of valuable knowledge thus increasing the potential for organizational change. International interest in social networks in the field of education has to date resulted in analyses of principal networks (Friedkin & Slater, 1994); school and teacher networks (Bakkenes et al., 1999; Coburn & Russell, 2008; Granovetter, 1986; Penuel et al., 2009); teacher professional development networks (Lima, 2007); departmental structures (Lima, 2004; Spillane, 2006); school-parent networks (Horvat et al., 2003); and between school networks (Mullen & Kochan, 2000; Earl & Katz, 2007). This study builds on recent scholarship emphasizing the importance of understanding relational linkages in support of implementing organizational change (Balkundi & Kilduff, 2005; Daly & Finnigan, 2009; Kilduff & Krackhardt, 2008), and makes a unique contribution to the literature by describing the decision making occurring through principal and district administrator networks across a large urban and rural district implementing a district wide technology policy. *The attributes of the decision making---content, types, structure and roles of the participants* is central to the interpretation of the nature of the decision making that is revealed by social network analysis, modified here by studying the work relations of principals as has been done between decision and policy makers in other large pan-institutional studies (Kowch, 2003; Kowch, 2013).

Administrators in a school district and their decision-making are described in this research. In a nuanced way, the deeper purposes of this explanatory case study research are to:

1. Describe the *nature of the decision making processes* and the *decision making network of administrators* who are responsible for implementing a district wide policy initiative.
2. Interpret study findings by using network and decision making models. The resulting descriptive and interpretive conceptual framework will *interpret data* for studying the decision making and decision making network practices used by leaders.
3. The identification of documents relevant to the decision making process. The range of documents included strategic plans, annual reports, project reports and meeting minutes.

The research questions guiding this study are:

1. What were the *key factors* that influenced the administrators' decision making in regards to the district wide technology policy?

Sub Questions:

- a. *Whom* do the administrators involve in the decision making process?
 - b. *How* do administrators involve others in the decision making process?
2. What are the *characteristics and functions* of the decision making networks that administrators experience when they respond to district wide school technology policy?

Sub Questions:

- a. Through what mediums do administrators maintain their decision making network relationships during the integration of the district-wide policy implementation?

Organization of the Chapters

This thesis is set out in six chapters, beginning with this overview chapter including an introduction to the research that describes the rationale and background for the research.

Chapter 2 is a literature review of scholarly thinking in the areas of principalship, decision-making, social network and organizational change. Chapter 3 describes the research methods and methodology. The research findings and descriptive data are presented in Chapter 4, which is comprised of a general summary of the decision processes found. Chapter 5 consists of comprehensive analysis of the findings and data followed by Chapter 6 which contains the conclusion and recommendations for future research.

Chapter 2: Literature Review

Organization of the Literature Review Chapter

This literature review grounded the research by focusing on several key elements (i.e., educational leadership, decision-making, social networks, principalship, and organizational change) that were necessary to offer important research as backbone to the intricate meanings and structures involved in describing and analyzing the administrator's behavior, experiences, perceptions, and interpersonal relationships. These elements were critically important in excavating or describing the networks of school and district leaders embedded in the decision-making process, in this study, in the context of a large geographically dispersed school district located in central Newfoundland. This literature review was organized into six sections, plus a concluding section consisting of a conceptual framework:

1. Background to the Study
2. Educational Leadership
3. Organizational Change and Leadership
4. Leader Decision Making
5. Social Networks
6. Technology as a Change Issue
7. Conceptual Framework

Background to the Study

Educational leadership literature relative to the problem of knowing more about decision making, relations and system wide change forms the foundation for the conceptual framework in this study. It is essential to begin with a broad definition of educational leadership followed by defining principalship in education.

Social interaction and relationships within the organization can provide a valuable way for researchers and practitioners alike to learn, assimilate and to make sense of their organization. Recognizing that sense making and learning are social activities, the integration of network literature with decision making literature creates an alternative framework through which to examine the relationships of school leaders as they work together to implement the district wide videoconferencing policy.

Educational Leadership

Policy efforts in education aim to improve teaching and learning. But there are huge differences in how school district leaders go about this. Some policies attempt to improve all schools in a district or province at the same time. Other policies attempt to influence the overall approach to teaching and learning within a school. Others focus on innovative curriculum that address one part of a school's program and aim for widespread implementation. As different as these approaches are, however, they all depend on the capacities of local leadership. The chance of any policy improving student learning is remote unless district and school leaders agree with its purposes and appreciate what is required to make it work (Leithwood, Louis, Anderson & Wahlstrom, 2004). Principals must also, for example, be able to help their school staff understand how the policy might

be integrated into local improvement efforts, provide the necessary supports for those whose practices must change and must win the cooperation and support of parents and others in the local community. Effective educational leadership is critical to implementing district policies. This is why we need to know what *effective leadership* looks like and understand a great deal more about how it works.

According to Leithwood (2007), the concept of educational leadership is about the internal state and the overt behaviour of leaders in large part. Internal state refers to the values, beliefs, skills or knowledge that leaders need in order to act in an effective manner. Overt behaviour refers to what it is that leaders do and their leadership practices including their decision making. Leithwood & Riehl (2003) claimed that educational leadership is made up of two functions: providing direction and exercising influence. Each of these functions can be carried out in different ways, and such differences distinguish many models of leadership from one another. Yukl (1994) agreed and added that educational leadership involves a social influence process whereby leaders affect followers. Without influence, leadership does not exist. Yukl notes that leadership influences "...the interpretation of events for followers, the choice of objectives for the group or organization, the organization of work activities to accomplish objectives, the motivation of followers to achieve the objectives, the maintenance of cooperative relationships and teamwork and the enlistment of support and cooperation from people outside the group or organization" (1994, p.3). Leaders of schools implementing a new policy face challenges: improving student achievement requires effective leadership to transform school climate and culture, increase the effectiveness of teachers and staff, enhance the curriculum, engage the

community and gain parental support and trust. Educational leadership research highlighted the importance of engaging others beyond the principal and district leaders in the success of new school policy.

In this study, the researcher found that the timing and process of educational leaders involved each other in the decision making process *varied* amongst the cases. As

Leithwood, Louis, Anderson & Wahlstrom (2004) describe:

Neither the superintendent nor principals can do the whole leadership task by themselves. Principals typically count on key teachers for such leadership, along with their local administrative colleagues. In site-based management contexts, parent leaders are often critical to the school's success. Superintendents rely on leadership from many central office and school-based people along with elected board members. Effective school and district leaders make use of external assistance to enhance their influence (p. 71).

Claims about the effects of educational leadership in both past and present studies of district level policies associated with improving student learning are justified by three different kinds of research method. One source of evidence is the interpretive qualitative case study which is typically conducted in school settings (Getzi, 1990). Such research finds educational leadership effects not only impacting student learning but also impacting an array of school conditions as well including implementing school wide policy (Mortimore, 1993; Scheurich, 1998). A second source of research evidence about educational leadership effects comes from large-scale quantitative study methods. Evidence of this type reported between 1980 and 1998 has been reviewed in several papers by Hallinger & Heck (1996a, 1996b, 1998). These reviews conclude that the combined direct and indirect effects of educational leadership on student learning are educationally significant. The third method for researching leadership effects are, like the second type,

also large scale and quantitative in nature. But instead of examining overall leadership effects these studies inquire about the effects of specific leadership practices. A meta-analysis by Walters, Marzano & McNulty (2003) significantly extended results from type of research. Their study identified 21 leadership “responsibilities” and calculated an average correlation between each responsibility and whatever measures of student achievement were used in the original studies. From these data, the researchers calculated a 10 percent increase in student test scores in a context where an average principal improved his/her “demonstrated abilities in all 21 responsibilities by one standard deviation” (p. 3). While the analysis by Waters, Marzano & McNulty produced interesting data, Leithwood, Louis, Anderson & Wahlstrom (2004) cautions that extrapolations from their estimates to principal effects on student learning in real world conditions must be made with considerable caution. They point out that the data is correlational in nature, but cause and effect assumptions are required to fully understand the effects of educational leadership on student learning. They added that the estimated effects on student learning described in the study depend on a leader’s improving their capacities across all 21 practices at the same time which would be an extremely unlikely occurrence. They point to the fact that this line of research is useful evidence which justify a strong belief in the contributions of successful educational leadership to student learning. Research about the forms and effects of educational leadership is becoming increasingly sensitive to the contexts in which educational leaders work and how, in order to be successful, leaders need to respond flexibly to their contexts. Such evidence argues for research aimed less at the development of particular leadership models and more at discovering how such flexibility is exercised by

those in various leadership roles. Research is also urgently needed which unpacks, more specifically, how successful leaders create the conditions in their schools which promote student learning (Hallinger & Heck, 1996b). Leithwood, Louis, Anderson & Wahlstrom (2004) added much of the success of district and school leaders in building high performance organizations depends on how well these leaders interact with the larger social and organizational context in which they find themselves. They add that more research needs to be developed in this area. *This research is specifically designed to explore the context of rural, urban and district leadership as they respond and make decisions about a district wide policy challenge.*

Conducting a review of educational leadership was important to this researcher because it was determined by Leithwood, Louis, Anderson & Wahlstrom (2004) that although there are many ways to approach school change, the success of each approach and its effect on teaching and learning is dependent on the effectiveness of the leader who initiates the change. Leadership initiating new policy in the educational setting involves district administrators and principals, so this study of educational leadership addresses these contextual features.

The Role of the District in Educational Change

The emergence of standards-based reforms and accountability systems at provincial and district levels has led to renewed interest in and inquiry into the district role in educational change. Spillane's (1998) case studies of school district and school responses to education reforms in Michigan reaffirmed the active policy shaping role of districts described by Fuhrman & Elmore (1990). Their analysis offered convincing evidence that

school district administrators can exert a powerful influence on the kinds of instructional practices favored and supported across a school district, and the degree of coherence in guidance provided to school staff. Elmore & Burney's (1997) case study of the transformation of New York City Community School District from an average performing to one of the highest performing elementary school districts brought the district role to the forefront as a potentially positive force for change (Stein & D'Amico, 2002). District leaders articulated a strategy for improvement that emphasized professional development, leadership, networking of expertise and decentralization of responsibility and decision making for implementation.

These studies provide research examples of individual and multi-site qualitative case studies of high performing school districts that explicitly set out to isolate what is happening at the district level that might account for the reported success in implementing change. Much of the research has concentrated on large urban schools districts. Key examples include Cawelti & Protheroe's (2001) study of change in six school districts in four states; Snipes, Dolittle & Herlihy's (2002) case studies of improvements in four urban school systems; Massell & Goertz's (2002) investigation of standards-based reform in 23 urban school districts across eight states. McLaughlin & Talbert's (2002) analysis of three urban California districts; Togneri & Anderson's (2003) investigation of five urban school districts from five states; and several single-site case studies of district success (Hightower, 2002; Snyder, 2002). This study will add to this research by focusing on a large urban and rural district in Newfoundland.

Most analysts of the contemporary role of school districts in change initiatives comment on the dynamic tension between district-wide goals for change and the need for leaders at the school-level to plan and organize in ways that fit the needs and characteristics of their specific contexts (Elmore & Burney, 1997; Marsh, 2002; Massell & Goertz, 2002; McLaughlin & Talbert, 2002; Togneri & Anderson, 2003). More successful district change initiatives decentralize considerable authority to schools to define student learning needs and to structure the use of professional development resources. The trick is for schools to do this in ways that do not fragment the coherence of overall change efforts across the district. According to Leithwood, Louis, Anderson & Wahlstrom (2004), more research is needed to clarify the district policy and implementation process that enable this bottom up/top down approach to change.

Principalship

Davies (2005) stated that educational leadership is about setting direction and inspiring others to work towards an improved state for the school. He adds that the principal plays a pivotal role in providing leadership in the school and through this leadership inspire others to work towards providing the best educational opportunities for students. Fullan's (2002) emphasis on leadership emphasizes the need for more people to participate in the school change to ensure its success. The principal's role is not to identify and promote any particular change strategy but to develop leadership and collaborate with the staff, parents, and community members to increase the school's success and improvement efforts over time. This shift in leadership focus from locating the right change

initiative to people development and collaboration parallels the change in corporate leadership models as well. Macmillan, Meyer, & Sherman (2001) state:

Since 1980, significant changes have occurred not only in our understanding of instruction, but also in the structures governing how this instruction happens. School boards have been reduced in number or eliminated; private partnerships have built new and often larger facilities to consolidate student populations; and school advisory councils have been created and/or given more power. These initiatives have politically and structurally altered the educational context in which in-school administrators work and have shaped, whether by design or by default, the leadership that they provide (p. 2).

Traditionally, job descriptions for principals focused on the administrative facets of the job, with the principal commonly labeled as the school manager. Some of the common characteristics of school leaders included good communication skills, curriculum knowledge, group processes, stimulating and evaluating staff, and leadership behaviors (Sergiovanni, 1995). The effective school movement of the 1980s caused scholars to understand the principal's role to shift to instructional leadership (Leithwood, 1988). Arguably, instructional leadership is or should still be a key component today to what in-school administrators do (Leithwood, 1992). However, with changes to education and its organization, administrators had additional responsibilities and expectations placed on them, which had the effect of increasing the managerial responsibilities placed on principals (Browne, 1990). Hurwitz (2002) described the expanding role of principals as this:

Imagine a job that requires an army officer's leadership skills, a CEO's management expertise, a lawyer's negotiating talents and an educator's understanding of how to teach children. That's what it takes to be a school principal in the 21st century (Hurwitz , 2002, p. 1).

Macmillan, Meyer, & Sherman (2001) assert:

Today we are attempting to move away from accepting a behaviorist view of managerial and administrative work of principals and instead, focusing on clearly defined, positivistic sets of generic strategies (Macmillan, Meyer, & Sherman, 2001, p. 3).

Emphases in the research have been on the creation of a professional knowledge base for principals (Donmoyer, Imber, & Scheurich, 1995), on helping principals become change agents (Fullan, 1982, 1992; Hargreaves & Fullan, 1998), and on encouraging principals to act as leaders in all aspects of the school (Senge et al., 2000). These more relational expansions of the principal role have broadened the initial definition of leader to include leadership inside and outside of the school into the communities it serves.

Macmillan, Meyer, & Sherman (2001) stated that society in which principals works have changed and these changes have influenced the principalship. Fukuyama (1999) adds that in light of those changes, it is critical to consider the context. This includes the culture, expectations and social norms of the community and school wherein the principal works. Leithwood & Riehl (2003) agreed with the position of leadership within a context by stating “Leadership is contingent on the setting, the nature of the social organization, the goals being perused, the individuals involved, resources and time frames and many other factors,” (p.9). Sergiovanni (2000) agreed that context is essential when defining leadership. “What a leader says and does to be effective in one kind of enterprise may not lead to effectiveness in another kind of enterprise” (p. 165). Hargreaves & Fullan (1998) assert that while urban centers continue to grow and family structures change, rural locations maintain strong traditional views about the principalship and the role of the school. Most rural principals teach full time in addition to fulfilling the other

responsibilities. While all principal positions come with their share of challenges and complexities, the challenges associated specifically with the rural principalship are unique. Phillips (2003) notes several key challenges that set rural school environments apart from urban. These challenges include having “less money to spend per pupil than other schools, the schools are significantly smaller which can reduce the ability of many rural schools to offer a full range of advanced courses, principals in rural schools are most often required to teach several subjects, and teachers in rural schools are required to teach many courses outside their specialty area” (p. 1). *Some of these important features of the principalship emerge in this study as integral parts of the findings about decision making and relations across the system.*

There is a rich body of evidence about the relevance to educational leaders of such features of the organizational context as geographic location (urban, suburban, rural), level of schooling (elementary, secondary) and both school and district size. Each of these features has important implications for what it means to offer successful leadership. For example, successful principals in inner city schools often find it necessary to engage in more direct and top-down forms of leadership than do successful principals in suburban settings. The curriculum knowledge of successful elementary principals frequently rivals the curriculum knowledge of their teachers; in contrast, secondary principals will typically rely on their department heads for such knowledge. Similarly, small school climates mean quite direct engagement of leaders in modeling desirable forms of instruction and monitoring the practices of teachers, whereas equally successful educational leaders of larger schools typically influence their teachers in more indirect ways; for example, through

planned professional development. This evidence challenges the wisdom of leadership development initiatives that attempt to be all things to all leaders or refuse to acknowledge differences in leadership practices required by differences in organizational context. Being the principal of a large secondary school, for example, really does require quite different capacities than being the principal of a small elementary school (Leithwood, Louis, Anderson & Wahlstrom, 2004). *This was important to the conceptual framework of this study because this study involved both rural and urban principals involved in implementing a district wide policy. This study found that the decision making features differed amongst the rural and urban principals in implementing this district wide policy.*

The Role of the Principal in Educational Change

Current school policy efforts such as this videoconferencing policy aim to improve teaching and learning. Even though there are many ways to approach school policy efforts, the success of each approach and its effects on teaching and learning is dependent on effective leadership initiating the change (Leithwood, Louis, Anderson, & Wahlstrom, 2004). Principals are responsible for making the system work. They interpret policy and see that policy decisions are turned into working programs at the school level. They also are responsible for rolling out the policy to staff. Theoretically, principals don't make policy, school boards do. But local school boards and other policy making bodies (Department of Education, legislators) lean heavily on principals for information and advice. Principals, in short, even as individuals, can exert a strong influence on policy (Howley & Eckman, 1997). A strong school with a committed principal can undertake and develop the task of building a student achievement initiative. Without the support and involvement of the

principal in such a plan even a school with a developed program policy and a stable staff will have great difficulty with long-term implementation and program acceptance (Barth, 2001; Preston & Whipple, 1997; Leithwood et al., 1999). Sills (1978) asserts that “the success of change is often dependent upon the degree of support received from the principal of the school in question” (p. 45). Weibe & Murphy (1993) maintain that “when initiating new ideas in schools, principals by virtue of their pivotal role in the system, and their knowledge and position of interaction with all interest groups, often decide whether a proposed intervention will be accepted or not” (p. 126). Preston & Whipple (1997) articulate this very clearly:

To be effective, a principal’s efforts need to be well planned, systematic, and ongoing. This becomes possible only when each person in the learning community understands the value of involvement and what personal actions are necessary to establish and maintain an effective relationship. The principal is the leader in fostering this atmosphere of collaboration (part1, p. 4).

A major factor in the adoption of change is the school principal (Fullan, 1998; Sarason, 1993). Studies found that the change initiative receiving the principal’s support were more likely to succeed, since the principal’s involvement indicates that the project is being taken seriously; and it helps in recruiting both material resources and psychological support (Marsh, 2001). In addition, the principal or leader of the project supplies the vision, which clarifies the joint goals for the benefit of the staff, and allows resource allocation to be conducted in the agreed directions (Meier, 1995). Changes in organizations have resulted in the invention of a new concept of educational leadership and a change to the role of a principal in implementing change initiatives-new principal roles are needed to take into

account the increasing dispersion of employees throughout a school district and the complexity of connections between them.

Louis, Leithwood, Wahlstrom & Anderson (2010) found that high student achievement was linked to the combined influence of educators, parents and others. According to this research, effective principals encourage others to join in the decision making process in their schools. The principal balances being directive and focused in setting a vision, aligning time and resources to foster effective teaching and establishing high standards for student achievement with distributing some of this authority to teachers and others within the school and allowing shared decision making. Likewise, principals must work closely with district leaders to affect change.

Conducting a review of principalship literature was important to this researcher because it had been determined by Owens (1998) that one of the most important elements of a school's culture and organization that a principal controls and influences is the decision-making process. Weibe & Murphy (1993) maintain that "when initiating new ideas in schools, principals by virtue of their pivotal role in the system, and their knowledge and position of interaction with all interest groups, often decide whether a proposed intervention will be accepted or not" (p. 126). Hence, reviewing the role of the principal in decision making and policy implementation was important to this research. Identifying the factors that influence the principal decision maker in implementing a district wide policy was necessary in the conceptual framework.

In this study, *knowing what the important factors that influenced the decision maker were was critical to interpreting how the leaders in this study made decisions regarding the*

implementation of a district wide policy. Understanding the differences in urban and rural contexts when defining the role of the principalship and how it impacted their decision making was important in the conceptual framework in understanding if and how context influenced the decision making process.

Given the multifaceted nature of leadership, it becomes clear that different leadership skills and connections are necessary in making decisions. Difficult decisions usually result in change, giving rise to conflict. An understanding of organizational change and leadership is relevant to this study because it demonstrated how building capacity for change minimizes the impact of difficult decisions of staff for change is an important task in principalship's decision making. Because this study focuses on district leadership and its impact on policy implementation, it is important to turn our attention to leadership and its role in implementing change.

Organizational Change and Leadership

Many researchers have moved away from Burn's (1978) concept of planned, controlled and quick change toward a realization that effective organizational change is a slow process that may only occur in context and by fostering leadership in both the internal and external environments (Allan & Cherrey, 2003; Fullan, 2001; Leithwood, 2000). Effective organizational change cannot be achieved with a one-size-fits-all cause-effect project. Gleick (1999) cautions leaders that society's culture is more complex and chaotic now and will continue experiencing unpredictable, rapidly occurring patterns of change into the 21st century.

Some researchers say that change has to be initiated from the place where it is needed.

Some emerging assumptions are that change can be affected from anywhere in the organization, that one person can make a difference and that even one interaction can affect the organization as a whole, and are complex but empowering images of organizational change (Allan & Cherrey, 2003).

Educational change involves a complex and dynamic process involving the transformation of behavioral patterns, changes in the school's identity, improvement of student performance and adaptation to environmental changes. Many researchers deal with the study of factors assisting or inhibiting the success of educational change (Fullan, 2001; Kinsler & Gamble, 2002), and specifically with relation to ICT (Malouf & Schiller, 1995; McLaughlin, 1991). Some emphasize organizational aspects and the means by which the organization prepares itself for the implementation of change in its structure and activities (Underwood & Underwood, 1990; Tyack & Cuban, 2002; Cuban, 1999).

Many researchers claim that without major change in the school structure (allocation of classes and teaching units) and in the learning processes (teaching and assessment methods) no significant change in educational process can occur (Sizer, 1993; Tyack & Cuban, 2002). Vital components of this change are organization of time and space, role distribution, communication patterns. In specific relation to ICT, a crucial factor contributing to the promotion of the policy is the availability of infrastructure resources as well as software. However, availability of ICT alone is insufficient and must be accompanied by technical as well as pedagogical support (Pelgrum & Anderson, 1999). Researchers stress the importance of systemic attempts to study the implementation of ICT

educational innovations with emphasis on the factors affecting the process (Gibton, 2001). They add that one of those important factors is the decision making process.

Allen & Cherrey (2003) believe each individual involved in the change process should “reflect on the traditional assumptions to see if they are inhibiting your capacity and potential for transforming the organization” (p. 14). Those individuals need to reflect on their practices to ensure that they create an environment where change can be embraced.

Fullan’s Educational Change

Fullan (1982, 1991) proposed that there are four broad phases in the change process: initiation, implementation, continuation and outcome. The change gets built into the structure (through policy/budget/timetable). Fullan & Stiegerlbauer (1991) add “there is enormous potential for true, meaningful change simply in building coalition with other change agents, both within one’s own group and across all group in the organization.

Fullan (1993) provide eight basic lessons that organizations can learn from the complexity of the change process. These include: you can’t mandate what matters: complexity of change in skills, thinking and committed actions in educational enterprise. Fullan commented that “effective change agents neither embrace nor ignore mandates. They use them as catalysts to reexamine what they are doing” (p. 24). Change is a journey not a blueprint: change entails uncertainty with positive and negative forces of change. Problems are our friends. Conflict is essential to any successful change effort. Fullan adds that vision and strategic planning come later: vision comes later because the process of merging personal and shared visions takes time. People learn about the innovation through their interactions with the innovation and others in the context of innovation. Deep

ownership comes through the learning that arises from full engagement in solving problems. Fullan states that neither centralization nor decentralization works. Successful changes require a dynamic balance two-way relationship of pressure, support and continuous negotiation. Connection with the wider environment is critical for success as change should recognize a broader context across the organization. Lastly, Fullan adds that every person is a change agent. It is only by individuals taking action to alter their own environments that there is any change for deep change. Fullan (1999) pointed out the importance of the recognition that the educational change process is complex. To deal with such complexity is not to control the change, but to guide it.

Leithwood & Jantzi (2005) stated schools that were dealing with organizational change such as the adoption of a policy initiative require “second-order changes” as building a shared vision, improving communication and developing *collaborative decision making processes* (Leithwood & Montgomery, 1986; Duke, 1987; Smith & Andrews, 1989; Sarason, 1990; Leithwood, 1992). It is with that focus we turn our attention to decision making. Reviewing the literature on educational change was important to the conceptual framework because researchers like Davis & Sumara (2006) illustrate that change is constant and complex organizations like school districts mean connections and relations help us define change and organization in constant changing settings. Scott’s (2004) reflections on the nature of emerging organizational trends also argue for increased attention to the relationships and connections through which organizational activities such as adopting a policy is conducted. Whereas leadership theories have been focused on durable, distinctive properties of entities, a complexity inspired model of leadership in

events such as change presents an alternative conceptual framework, based on relationships, complex interactions and influences that occur amongst individuals (Kowch, 2013). While this research does not take a complexivist mindset per se, it does employ a more explicit study of leader relations in networks using network theory that is in accord with complexivist sensibilities that the school district is a constant flux, changing and higher interconnected space (Davis & Sumara, 2006).

Decision Making

Two kinds of decisions exist within policy and technology: adoption and progress decisions (Moon, 2001). In adoption decisions, one must decide whether to begin a task, buy a certain product, etc. There are many examples of ICT adoption decisions in education, including such decisions as whether to adopt a particular technology policy or whether to adopt a particular district wide management system. Progress decisions, on the other hand, refer to implementation situations. Once the adoption decision has been made, there is work involved in getting everything in place; from there, there are ongoing operations to manage. Both the initial set-up and the ongoing operations can go well or poorly, and decision makers must monitor the progress. Decisions that affect how well or poorly such a policy or ICT plan is carried out throughout the entire system are known as implementation decisions. The particular school district in this study formulated its videoconferencing policy at the district level and then issued an implementation directive to the schools that was hierarchical in nature. Within that context, this study focused only on the implementation decision making process.

In reviewing the literature, the researcher identified numerous decision making models that leaders may utilize in order to guide their decision-making process. These included the classical or traditional model, the incremental model, the mixed-scanning model, social judgment model, Pettigrew's decision making model, ACTIONS model, and the multiple stakeholder decision making model. The following sections describe each of these models in detail.

The Classical or Traditional Model

Philosophically, classical or traditional decision-making is grounded in the concept of scientific rationality. It is based on the notion that leaders are trying to “maximize the chances of achieving their desired objectives by considering all possible alternatives, exploring all conceivable consequences from among the alternatives, and then making a decision” (Lunenburg & Ornstein, 2000, p. 214). In it, clear steps are outlined for a decision-maker to follow. After all the steps are completed, a logical decision should emerge based upon the assumption that one best solution is possible for any given situation (Hoy & Tarter, 2004).

Scholars explain this model as having delineated steps that decision-makers can follow (Hoy & Tarter, 2004; Lunenburg & Ornstein, 2000; Owens, 2001). These steps include identifying the problem, generating the alternatives, evaluating the alternatives, choosing an appropriate solution, and converting the choice into effective action (Hoy & Tarter, 2004; Lunenburg & Ornstein, 2000; March, 1994; Owens, 2001).

When researchers attempted to employ this model in real world situations, problems were encountered with its feasibility. Scholars and practitioners came to question its

efficacy in addressing problems amidst the “hustle and bustle” of daily activities within organizations (Hoy & Tarter, 2004). Ultimately, many concluded the classical or traditional heuristic was flawed. One of its limitations is it anticipates the availability of both complete information and the assumed cognitive ability of the decision maker to always correctly analyze a problem. In many circumstances, these assumptions are unrealistic (Tarter & Hoy, 1998). Given its limitations and flaws, this model was not used in this study.

The Incremental Model

In the late 1950’s and 1960’s, Charles Lindblom (1959, 1964, 1979) developed a theoretical construct to aid in making decisions within a business or political organization. He described this incremental model as “the science of muddling through” (p. 86). According to Lindblom, decision-makers do not always see a clear goal when solving a problem. Context is a major factor when assessing a problematic situation; it is extremely unlikely that one type of decision-making works best for all situations (Lustick, 1980). Despite a leader’s grasp of the context, addressing problems may make decision-makers uncomfortable because they perhaps lack the confidence to define clear objectives. Instead, some leaders prefer to “muddle through” by making small decisions, checking the consequences, and continuing on until the problem is solved (March, 1994; Rallis & MacMullen, 2000). Lindblom (1959, 1964) refers to this process as incremental decision-making. Incremental improvements are made on a small scale without looking at the long-term effects of the decision on the organization. Muddling through is a process used for putting out fires in an organization instead of charting a course to develop a stronger policy or decision and, in the end, a stronger more viable organization.

The incremental model limits the decision-making focus and reduces information demands therefore making outcomes more easily judged (Lindblom, 1980). Multiple decision-makers may also compensate for the inadequacy of the decision-makers' knowledge of options and possible solutions to problems. It is based on the assumption that by increasing the number of individuals involved, the number of solutions will also increase. The incremental model offers an alternative that some scholars believe provides a way to effectively handle complex decisions in a practitioner setting (Cohen, March, & Olsen, 1972). Muddling through, at times, allows harmony to be kept within an organization. It allows for decisions to be made on the fringe or margin and thereby not totally alienating a group or individual. However, critics raise a number of issues with this model. The flexibility associated with the incremental model implies that it is unfocused, thereby potentially allowing decision-makers to drift from their intended purpose (Vandenberghe, 1995). Critics raise other issues with this model. They argue that the process may neglect basic innovations, focusing on the short run and seeking limited variations from past policies (Etzioni, 1979). Lustick (1980) suggests that this model relies exclusively on informal reasoning, thus limiting its practicality for the working professional. This model was not utilized in this study.

Mixed Scanning Model

Amitai Etzioni (1967, 1986, 1989) proposed an approach, known as the mixed scanning model, that attempted to combine the best aspects of the classical and incremental decision-making models together. This model views decisions as the outcome of give-and-take or mutual adjustments between the various interests involved in the decision-making

process (Etzioni, 1967). In schools, it is usually impossible to gather all the information necessary to make a decision. Within these circumstances, using the mixed-scanning, the decision-maker utilizes an incremental approach in order to approximate an answer to a given situation using an existing organizational policy or philosophy as a general guideline (Etzioni, 1986, 1989). In doing so, the decision-maker may make decisions with limited information, while remaining confident the policies or the philosophy of the organization has not been compromised (Etzioni, 1967, 1986).

Etzioni (1989) outlined seven principles to guide mixed-scanning decision-making. First, decision-makers should continually search for alternatives and check the outcomes of decisions for changes in decision-making action. Secondly, decisions should be made slowly to allow for adjustments in strategy. Third, decision-makers should procrastinate, especially in cases where the situation is complex or objectives are uncertain. This stance allows the decision-maker more time to look for information, analyze the data, and search for alternative solutions. Fourth, leaders should commit to decisions in stages, assessing prior outcome before beginning the next phase. Fifth, if uncertain, decision-makers should test staged decisions prior to fully committing resources. Sixth, decision-makers should consider implementing competing alternatives that may lead to desired outcomes. Seventh, leaders must be prepared to reverse a decision that has already been made.

The mixed-scanning method provides many benefits. With it, decisions may be made flexible. Should a solution fail, the decision-maker might gather more data and try again (Brown, Boyle, & Boyle, 1999). By following the organization's policies and philosophies, decisions could further the goals of the organization, not the individual

(Johnson & Scollay, 2001). This model was not used in the conceptual framework in this research. Instead, the researcher used the Bates (2000) and Brazer & Keller (2006) models which relies less on the decision process as a sequence of steps (heuristic models) and more on the decision process as a flow of information in a collective entity emerging around a mission such as implementing a policy, in a given organizational context.

Social Judgment Model

Social judgment model is an explanation of how decision makers handle information. This theory focuses on the difficulty “inherent in the task of integrating complex, probabilistic information from a variety of sources to arrive at a decision” (Guzzo, 1982, p. 20). The social judgment model is a framework for understanding the many causes of conflict and “misunderstanding” in the decision-making process. Social judgment model provides decision-makers with an understanding of the interrelatedness of the subject (decision-maker), its environment, and the quality of the decision.

Organizations using this model of decision-making must fully understand that the “decision-makers (subjects) and the environment must operate as a system, each with properties of its own. Decision-makers operating under the social judgment model must know the environment in which the decision is being made and have enough information to make a decision. Small groups such as school boards have effectively used social judgment model during the decision-making process regarding “policy applications” (Hammond et al., 1980, p. 132). This model was more suited to small group decision making. It was not used in this study.

Pettigrew's Decision Making Framework

Although originating in the domain of operations and management research, Pettigrew's (1985) model of decision making has been applied to other fields. For example, Symons (1990) introduced Pettigrew's framework into the discipline of information systems evaluation, having recognized the similarities between organizational change and the implementation of information system in organizations. Pettigrew's (1985) framework is depicted in Figure 1.0. below.

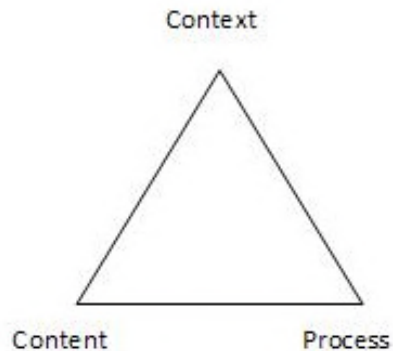


Figure 1.0 Pettigrew's (1985) decision making framework

Pettigrew's (1985) framework consists of three parts. The content refers to the decision situation. Process refers to the methods used in the decision making process. The context refers to the individuals involved in making the decisions (Hoy & Tarter, 2004; Lunenburg & Ornstein, 2000). Pettigrew's (1985) decision making framework was not used in the conceptual framework for this research, although the parts of the framework helped the researcher understand the features of decision making. Content, context and process were

attributes found also within the Brazer & Keller multiple stakeholder decision making model.

ACTIONS Model

Bates (2000) developed educational technology specific guidelines that decision makers can use to build a more comprehensive technology plan filled with *making ICT adoption or implementation decisions*. Bates ACTIONS model reminds decision makers to consider many key aspects of educational ICT decisions, such as user (student and learner) needs, usability, all costs (not just the initial investment), teaching/learning goals and methods, and organizational issues. The ACTIONS framework is not a comprehensive checklist; rather, it is a guide to prompt discussion of specific considerations as they apply to each decision context.

It is important to recognize that implementation of policy is a complex procedure ranging from district policy creation to leader practices focused on policy implementation. This involves careful consideration of such factors as management, funding, acquisition of technology, ICT training and impact on pedagogy for in this study, videoconferencing (technology) is the object of policy implementation across the district.

Bates (2000) provided a review and a model of the most common reasons that leaders adopt and utilize educational adoption and utilization of IT-based learning or discourse: (a) improving access, (b) improving the quality of learning, (c) reducing the costs of education, and (d) improving the cost effectiveness of education. Bates (2000) proposed the ACTIONS (Access and flexibility, Costs, Teaching and learning, Interactivity, Organizational issues, Novelty, Speed) model when considering an

educational technology. According to Bates on the application of the model, decision makers must consider the impact of the proposed technology on either the student (access, novelty, speed, interactivity); the institution (cost, organizational issues, teaching functions, interactivity); or in some cases, both. “The best use of technology occurs when the academic not only has a deep understanding of the subject but also has an imagination and a vision of how the subject could be taught differently with new technologies” (Bates, 2000, p. 75). When using the model it is important to consider who the intended learners are, how they will get the instruction, what will it cost, how it will be taught, what kinds of interaction will take place, what are the organizational issues, what technology will be used and finally how quickly can the latest information be delivered to the student (Bates, 2005). The Bates ACTIONS model (2000) was a significant part of the conceptual framework used in this study to determine the factors that influenced the decision makers when implementing the videoconferencing policy. This researcher used the ACTIONS model as one part of the conceptual framework in this research because the seven factors in the ACTIONS model were sufficient to allow this researcher to provide a determination of several technology-contextualized decision making factors in this technology-context, interpretive research.

Multiple Stakeholder Decision Making Model

Brazer & Keller (2006) also developed a conceptual framework intended to help leaders and researchers explain the process of making decisions along a continuum from an initial decision to a change policy, procedures or programs through implementations in the classroom. Different components of the model account for differences in stakeholders’

objectives and influences, varying degrees of collaboration, the concept of coupling between decision makers and stakeholders, and feedback in many directions as decisions evolve.

The model serves in this study to understand how *specific school policies* are adopted and how they are *implemented* as envisioned, ignored or modified (see Figure 2.0.). It applies to strategic decisions----specifically the deliberate attempts on the part of districts and schools to make change.

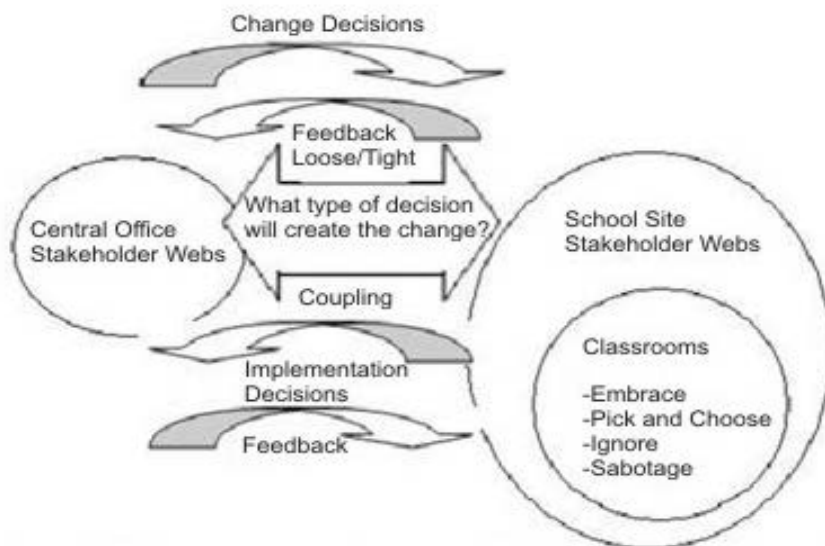


Figure 2.0 A conceptual framework for educational decision making by Brazer & Keller (2006)

The model conceptualizes *which* stakeholders *or who* participates in a particular decision. It considers the *role of participants* both *inside* and *outside* the organization who will have varying degrees of influence on decisions made from an initial policy through implementation. This important when considering decision making beyond the classical

structure of a school, in case relationships among decision makers span the ‘usual’ institution boundaries as they do in this research of an entire district. Using this model, we describe school board, the superintendent and principal as connected members working within a web of stakeholders. The superintendent and district administrators make decisions concerning a school district’s goals and strategies. Then principals and school based administrators make decisions concerning those goals and strategies to accomplish in relation to their schools. Department heads and team leaders make curricular and operational decisions to carry out the day to day activities of their department or unit. Finally, classroom teachers make decisions in their classrooms.

Their webs may overlap to some degree because of the public and open nature of schools and districts. Which stakeholders are relevant in any given leader’s web depends on the decision or decisions being considered. Stakeholders most likely enter and exit the web as their interests change over time and as decision foci change. Following the decision to make change is a chain of decisions required in implementing the desired change. The specific *content of decision making* that occur at the school level depends on the amount of decentralization from district office as well as the nature of the change initiative itself. The content of decision making that can occur within this multiple stakeholder web can include making decisions around *establishing goals and expectations*. This includes setting goals and developing a plan of action for implementation. There are *strategic resourcing* decisions in terms of infrastructure and resources needed in implementing the policy. A third decision making involves *planning, coordinating and evaluating instruction and the curriculum*. This involves decision making in terms of the support and evaluation of

teaching through the policy. The fourth decision making includes *promoting and participating in learning and development*. This is decision making around the professional learning necessary for successful implementation of the policy. Finally, there is decision making around ensuring there is an *orderly and supportive environment*. This involves monitoring and checking on the progress of the implementation process occurring (Brazer & Keller, 2006).

Often policy guidelines set the framework for decision making. Other times policy is made at the discretion of the school leaders. The dynamics vary primarily due to the context and organizational structure of the school. For example, many smaller schools may not have leadership positions such as department heads, so many of their operational or curriculum decisions are made instead by the principal or delegated to other staff. *This model will be used in this study to identify what type of specific implementation decisions were made by the school leaders in implementing the district wide implementation policy.*

This model addresses the nature of stakeholder involvement. It depicts the extent to which a leader might engage in collaboration with other members of the organization. The model presents *four types of collaboration* that a leader chooses from given a specific group's characteristics. These include Type 1-leaders explain rationale for decision to followers when follower motivation and expertise are low. Type 2-leader seeks input from followers, makes the decision and explains rationale for decision when follower motivation is high and expertise is low. Type 3-leader works as a peer with a group of followers to arrive at a consensus decision when follower motivation is low to moderate and expertise is high. Type 4-leader delegates a decision to followers, holding them accountable to meet

predetermined goals and standards when follower motivation and expertise are high. These collaborative styles range from being autocratic, democratic, participatory, or consensus. It is important that an organization doesn't get in a rut of using only one style of decision making because certain decisions require different styles. It is important that decision makers focus on choosing the right style for the particular decision at hand.

In all, the model provides a comprehensive *framework for describing implementation decisions*. According to the model, analyzing decision making based on its *content, type, structure and roles of the participants* is central to the interpretation of the nature of the decision making process. The Brazer & Keller (2006) conceptual framework for educational decision making was critically chosen as the second part of this study's conceptual framework because the model facilitates the identification of decision making factors and elements, and relates the findings to implementing a policy. The model considers the role of relations and connections among stakeholders to the decision making process.

Leithwood & Jantzi (2005) stated schools that were dealing with organizational change such as the adoption of a policy initiative require developing *collaborative decision making processes*.

Collaborative Decision Making

Unlike managers, leaders make instructional quality the top priority of the school. Rather than being in the role of just one person, the leader role becomes a role that is shared with other educators. Through demonstration of effective leadership, principals are able to convince other stakeholders to take on more leadership roles. Principals strive to achieve

high levels of commitment from other stakeholders and work interactively with them in a shared instructional capacity (Sergiovanni, 1991). Schools that develop such integrated leadership, learn and perform at higher levels (Marks & Printy, 2003). Hoerr (1996) suggested that principals need to share the responsibility for instructional leadership with teachers. Principals will need to share power and develop collaborative leadership teams so that teachers will be more involved. Neuman & Simmons (2001) add that leadership is the job of the entire education community and must be distributed. DuFour & Eaker (1998) stated that the principal's role is more facilitation through leading rather than commanding and controlling. They stressed that the principal must have an understanding of their staff to determine how much of the leadership they can share and how prepared the staff are to work in effective collaborative teams. Principals promote the development of leadership capacity within the school community. Decision making is informed through dialogue and multiple perspectives. It becomes clear from reviewing the literature on effective practices that one of the most important elements of a school's culture and organization that an administrator controls and influences is the decision-making process.

An effective administrator must foster a culture in which others can contribute to the decision-making process. The administrators' assumptions about the nature of organizations and the people in them determine the decision-making approach they accept. Styles ranging from autocratic to highly participatory may be utilized by the administrator, after analysis of the contingencies in each situation (Owens, 1998).

The trend in many of today's organizations is to develop and promote collective and collaborative cultures, even though still hierarchical in structure. The issue that confronts

the administrators of such organizations is not if others should be included in decision-making, but rather how and to what extent they will be involved. The current trend points toward participatory decision-making. Owens (1998) notes, "this pattern is clearly evident in the body of research literature...called human resources development (HRD)" (p. 267). Administrators who involve others on a limited basis or on low-level problems are not embracing the potential of participatory decision-making (Owens, 1998). Modern, empowering administrators celebrate the idea that one gains power by sharing it. He states:

Empowerment through participation in decision-making (meets) the intrinsic motivational needs of individuals and to strengthen the growth-enhancing qualities of the organizational culture in a way and to a degree that traditional decision making methods simply cannot match (p. 283).

Simon (2001) notes that there are two basic assumptions about decision-making. The assumption that decision-making is an orderly, rational process that possesses an inherent logic, and the assumption that the steps in the process follow one another in an orderly, logical, sequential flow (which some refer to as linear logic). Organizational goals, technologies and environments have become so complex that making decisions is not simply a matter of identifying cause and effect relationships. Simon points out that ambiguity and uncertainty are dominant characteristics of the real world of the educational administrator. If traditional approaches to decision making are not working, then one must focus on human resources approach where a more collaborative, team effort would enhance effectiveness. "Modern, empowering administrators, on the other hand, understand that one gains power by sharing it with others because in collaborative effort the power available to the group multiplies" (Owens, 1998, p.283). Facilitating collaborative decision making is a

critical task for leaders in their roles as technology leaders. In the past, school decision making was viewed primarily as the domain of a single person in charge (Gronn, 2008). That person made decisions and then their employees carried out their orders. We now know that school organizational structures that share decision making result in better outcomes in regards to employee involvement and engagement (Hulpia, Devos & Van Keer, 2011; Murphy, Smylie, Mayrowetz & Louis, 2009) as well as student achievement (Hallinger & Heck, 2009).

According to Silins & Mulford (2002), if the leader empowers others and delegates responsibilities, followers are able to share in the decision making process. Such leaders also support participation for followers by inviting them to be part of the strategic planning process in an organization. By encouraging others to adopt the vision of the organization, leaders help followers feel ownership for the desired results. This process promotes continuous quality improvement within the organization. By involving others in the decision making process, leaders help establish a climate of trust and self confidence in the organization. At the core of collaborative leadership is a raised awareness of self, relationships and the organization (Hallinger, 2003).

As applied to schools, there are at least four perspectives on why it is important to engage in collaborative decision making. From a bureaucratic perspective, these reasons include gaining staff compliance with administrator decisions and building staff loyalty to administrators. A human relations perspective argues that staff should be involved in decision making as a means of enhancing job satisfaction, morale and feelings of professional self-efficacy. From this perspective, staff involvement is a means of avoiding

feelings of powerlessness and workplace alienation, both of which can lead to stress and burnout. Finally, organizational learning research argues that staff involvement in authentic forms of decision making is a central mechanism for making better use of the intellectual capacities distributed throughout the organization (Dinham & Scott, 2000). As so much of the decision making literature indicates, *staff may experience involvement in decision making through structures such as staff meetings, department structures, committees and school councils*. Whatever the form or structure, evidence suggests that staff usually have the strongest desire to participate in decisions that most directly affect their work in the classroom, showing less need for involvement in policy or organizational decisions. This evidence also suggests that the most beneficial consequences of participation are achieved when staff feels neither deprived nor saturated with opportunities for decisional participation. Nye & Capelluti (2003) describe their guidelines as the “ABC’s of Decision Making” (p. 8). “A” decisions are those that leaders make alone. These situations usually are decided autocratically or without input from other members of the organization. “B” decisions are bureaucratic and made with consultation from a selected few within the organization. “C” decisions require input from everyone in the organization, leading to consensus (p. 8-10).

Smylie (1997) found that teachers appeared to be more involved in school decision making if their relationship with the school principal was perceived to be “open, collaborative, facilitative and supportive” and less involved if their relationships were seen as “closed, exclusionary and controlling” (p. 63). Teacher empowerment requires the principal to develop a climate of trust and respect (Blasé & Blasé, 2001; Murphy, 1994;

Short & Greer, 2002; Wall & Rinehart, 1998). Transformational leadership was a reaction by those who were opposed to the top-down directive style of leadership. This model allows leadership to be shared or distributed, coming from teachers as well as from the principal. Transformational leaders focus on bringing about change through bottom-up participation (Hallinger, 2003). Depending on the school context and experience and attitudes of teachers, the principal can share responsibility for decision making (Hoerr, 1996) through a collaborative team structure (DuFour & Marzano, 2009). *This was important to the conceptual framework in this study in analyzing in what decision situations principals shared decision making with staff.*

Gronn (2002) distinguishes between two basic forms of collaborative decision making processes, additive and holistic. Additive forms entail the dispersal of decision making tasks among members across an organization without explicit consideration of interactions by those members; this is the most common meaning of the term “everyone is a leader” (Manz & Sims, 1980). Holistic forms of collaborative decision making include attention to the interdependence of those making decisions. These holistic forms of collaborative decision making views decision making as a dynamic, multidirectional, social process which, at its best, lead to learning for both the individuals involved, as well as for the organization. That should be the focus of future research studies. This reinforces the significance of *relationships and trust* to the leader decision-making process. It is within that context that this research study analyzes decision making based on a systems perspective that focuses on the relationships of key decision makers in the system throughout the policy implementation process. *In this study, the researcher found that when*

and how to allow others to collaborate in the decision making process was considered differently in different cases, as the findings showed.

Organizational Learning

Organizational learning typically adds to, transforms or reduces organizational knowledge. Theories of organizational learning attempt to understand the processes which lead to (or prevent) changes in organizational knowledge, as well as the effects of learning and knowledge on behaviors and organizational outcomes (Schulz, 1992).

Organizational learning draws much of its appeal from the presumption that organizations are capable of intelligent behavior, and that learning is a tool for intelligence. The basic image is that organizations collect experiences, draws inferences, and encodes inferences in repositories of organizational knowledge, such as formal rules and informal practices. In this view, organizations are shaped by complex learning processes which combine current experiences with lessons learnt in the past.

Current approaches to organizational learning emphasize routines as repositories of knowledge and they conceptualize learning as making and updating of routines in response to experiences (Schulz, 1992). Routines are regarded as recurrent sequences of action which span multiple organizational actors and assets. Examples of organizational routines include organizational rules, roles, conventions, strategies, structures, technologies, cultural practices and capabilities. In this view, organizational routines function as the primary form of organizational knowledge. Organizational routines are independent from the individual actors who make and execute them and they frequently

persist even after their creators have left the organization. Routine-based learning is thus located on an organizational level, above the level of individual learning (Schulz, 1992).

A dominant notion in this field is that organizational learning is brought about by learning processes which facilitate, impede or direct the change, dissemination, and use of organizational knowledge. A number of learning processes have been explored. One is performance feedback. It involves a simultaneous adaptation of routines and aspirations to experience. Organizations adjust their routines when performance falls short of aspirations. At the same time, organizations adjust their aspirations to past experiences and experiences of others (Schulz, 1992).

More and more research is stressing the importance of decision making being data based. It is within that context that we now turn our focus to data driven decision making.

Data Driven Decision Making

Provincial policies currently place demands on school district central offices to use a range of sources of data to ground a host of decisions related to how central offices operate and how they work with schools. Policy texts tend not to elaborate the process by which evidence should be used but rather emphasize broad forms of evidence that should be used related to specific types of decisions about school improvement (Honig & Coburn, 2008). Much of the literature on data based decision making (Coburn & Talbert, 2006; Lachat & Smith, 2005) raise questions about which forms of data district administrators currently use in their decision making, the purpose for which they use data, the processes by which they use it, and ultimately, the conditions that may help or hinder data use. They argue that answers to these questions can help policy makers and others gauge the extent to

which district administrators may be receiving the supports necessary to use data in their decision making. Both the school and district leaders in this study highlighted using data to guide their decision making.

Research highlights instances of district administrators using multiple forms of data as the basis for their decision making. Corcoran and Associates conducted a mixed-methods study of the use of research in instructional improvement in three large urban districts. Their data included nearly 75 interviews with district administrators over three to five years that were analyzed for patterns in decision making. They found that district administrators used student data, expert advice and evaluation information to make decisions about curricular approaches and to develop lists of district approved comprehensive school reform approaches (Corcoran, 2003; Corcoran, Fuhrman & Belcher, 2001). Likewise, Massell & Goertz conducted a major study of data based decision making in the context of standards based reform implementation involving an examination of 23 districts in eight states over 3 years (1966 to 1999). They found that it was not uncommon for district administrators to ground their decisions in multiple forms of data including student performance data. District administrators also used data on student performance on standardized tests to guide decisions about selection of school-based programs (Massell & Goertz, 2002).

Information gained from the experience of educators-school principals, teachers and central office administrators-informs a range of district administrator decisions including their choice of curriculum and whole school reform designs (Datnow, Hubbard & Mehan, 2002). Mixed methods studies (involving document reviews and district administrator

surveys and interviews) by Marsh (2006) and Massell (2001) found that district administrators drew on data such as student performance data, perception data, process data, parent and community input and their own experiences to inform decision making. Research literature suggests that district administrators do use data for purposes that they tie directly to strengthening students' school performance. Across studies, district administrators reported in interviews and surveys that data guide their decisions regarding whether to retrain or to replace programs and how to allocate staff to improve student achievement outcomes (Corcoran et al., 2001; Kean, 1983; Neuman, Brown & Rivers, 1983; Robinson, 1988; Weiss, Murphy-Graham & Birkeland, 2005). This literature review was important to the conceptual framework in this study because it provided additional detail to the Brazer & Keller (2006) conceptual framework for educational decision making and was used by the researcher to provide clarification to the *types of data used by the administrators in the study and for what implementation decisions*.

Studies show that the nature of individual district administrators' social capital-their formal and informal ties with others and the *degree of trust* that characterize-influences data use. The district administrators in this study used data provided through relations with those leaders identified as important in their decision making network. They questioned some of the data provided by principals. For example, in a study of implementation of mathematics and science reform in nine school districts, Spillane & Thompson (1997) argued that higher levels of collaboration in districts resulted in greater access to data. Honig (2003) found that district central office administrators seemed better able to collect evidence about student performance from schools when principals trusted that the

information would be used to support rather than penalize them. Marsh's (2002) study revealed that high levels of trust between district administrators and principals helped to increase the availability of various forms of data, including school and community feedback. Participatory processes such as staff meetings and consulting with colleagues fostered the development of common frames of reference or ways of viewing issues as well as social capital that guide how groups interpret evidence and incorporate it into their decision making (Honig, 2004b; Honig, 2004c; Kennedy, 1982a; 1982b). Social capital is defined as "the resources available to participants as a function of their location in the structure of social relations" (Adler & Kwon, 2002, p. 18). This approach pays careful attention to the way that individuals are situated in social networks and how social ties enable such individuals to access and make use of valued resources (Coleman, 1990; Portes, 1998). When applied to education, social capital considers the resources that are available to district leaders through social interaction with colleagues, and it posits that particular features of social relations are more or less conducive to accessing appropriate resources and creating an environment that enables change. The sources of social capital that impact on leader decision making in creating this environment of change include structure of ties, trust and content of interaction (Adler & Kwon, 2002). Other researchers provide evidence that social capital influences a range of outcomes related to policy implementation, including increased problem solving, transfer of information and diffusion of innovations (Adler & Kwon, 2002; Frank et al., 2004; Gibbons, 2004; Penuel et al., 2009; Uzzi & Lancaster, 2003). It is within these features of leaders' social relations and the resources available through them that can create conditions that foster effective decision

making. In this study, school leaders used their relations to acquire information and knowledge to aid in their decision making regarding implementation of the policy. Social capital theorists draw on a methodological approach called social network analysis as a means to investigate the relevant features of leaders' social relations. This study draws on the features found in social networks to analyze the decision making network patterns found among the district administrators in this study as they implemented a district wide videoconferencing policy. Those patterns amount to a structure of organization that adds to our understanding of pan-district decision making among leaders.

Social Networks

Studies in education have historically paid little attention to the structure of leaders' social relations (Penuel et al., 2009). Yet a growing body of research suggests that structure of networks is associated with a range of outcomes related to policy implementation. One important dimension of the structure of social networks is the strength of ties between individuals. The strength is a function of emotional/social closeness and the frequency of interaction (Burt, 1992; Granovetter, 1973; Hansen, 1999). Recent work in organizational studies provides evidence that strong ties facilitate the transfer of knowledge (Hansen, 1999; Reagans & McEvily, 2003; Uzzi, 1997); joint problem solving (Uzzi, 1997), and the development of coordinated solutions (Uzzi, 1997) all of which are important to the policy implementation process.

Principal relationships can take many forms and include a whole range of people, including both those within and outside the organization (Sergiovanni, 1994). By seeing organizations from a social network conceptual framework, organizations can be viewed as

clusters of people joined by a variety of link types and intensities-links to each other (Cross & Parker, 2004). The idea of a network implies the existence of more than one link in a pattern of associations and relationships between people and systems in schooling. This framework for understanding community work by principals can be a more effective, helpful depiction of principals in any setting where they must organize interests in response to a policy or other major issue (Kowch, 2003). So by viewing organizations from a social network perspective the researcher makes the assumption that all members of the organization or at least some can be involved in decision making within some form of a network of interrelationships with each other or with people who do actually make decisions.

Cross & Parker (2004) state that, “We are all affected by webs of relationships within social networks. These networks are often not depicted on any formal chart, but they are intertwined with an organization’s performance, the way it develops and executes strategy, and its ability to innovate. For most of us, networks also have a great deal to do with our personal productivity and learning” (p. 3).

The assumption made is that people in organizations interact and communicate. Interaction can be purposeful, random, forced, or constrained by factors external to the individual. Various reasons have been offered why members of an organization interact, but it largely appears to be out of a desire to make sense of and successfully operate within their environment. Even though initial interaction may be random, repeated interaction is not. Repeated interaction leads to the development of patterns of relationships or social networks (Tuten, 2006).

Research has found that there are a number of variables that *influence whom one chooses as part of their network*. Social networks develop as individuals form network ties based on their perception of others, reaching out to those who appear to occupy a *similar structural position* (e.g., having the same role; Frank & Zhao, 2004; Hite, Williams & Baugh, 2002). Other researchers emphasize the *role of prior relationships*. Prior professional relationships facilitate trust by reducing uncertainty and creating shared expectations for engagement (Larson, 1992; Uzzi, 1997). Others emphasize the role of *organizational conditions*. These studies provide evidence that formal organizational structure-like grade level and departments-shape patterns of interaction (Adler & Kwon, 2002; Bidwell & Yasumoto, 1999; Gamoran, Gunter & Williams, 2005; Penuel et al., 2004) and that school leadership plays a role by fostering an atmosphere of trust, shaping channels of communication and communicating and enforcing norms of interaction (Bryk & Schneider, 2002; McLaughlin & Talbert, 2006; Smylie & Evans, 2006; Smylie & Hart, 1999; Sutherland, Smith & Wallace, 2007). People tend to interact with others who are similar to themselves on *attributes such as sex, education, and age* (Brass, 1995; Ibarra, 1995; Marsden, 1990). According to Fisher (1986), another variable tends to be *acquaintanceships or physical proximity*. Whom one knows personally appears to increase the likelihood of communication, although interaction in itself tends to affect the likelihood of interpersonal interaction (Krackhardt & Stern, 1988). *This literature was used in the conceptual framework for this research in analyzing the reasons given by district leaders for establishing their network ties*. The researcher turns now to literature on whom within the principal leader`s network influence their decision making as Hoing stated:

Principals use social networking to seek advice to use in their decision making. Hence, school districts would be wise to foster professional networks among leaders in order to retain and spread valuable organizational knowledge that would aid in effective decision making (2008).

It is within this context that this researcher turns our attention to identifying what variables influence with whom the decision makers interacts and chooses to be part of their decision making network as well as the function served by that relation.

Agents of Socialization

Social network researchers contend that there two types of links or potential referent others: cohesive actors and structurally equivalent actors. “Cohesive actors are individuals with close interpersonal ties, or friends. Structurally equivalent actors are individuals who share a similar pattern of relationships with others and thus occupy the same position in a network” (Shah, 1998). Results from Portner’s (1997) study into the networking of principals show that school administrators do access one another when necessary or desired. Principals confide and seek advice from each other. They share their experiences with similar incidents or simply use each other to share views. According to Fisher (1986), subordinates and self are important agents of socialization: Subordinates include those with whom the principals interact on a daily basis, such as teachers and students, or those who provide resources, such as central office personnel. Fisher (1986) states “everyone ultimately socializes him or herself by choosing which socialization agent to use” (p. 137).

Kram (1988) makes the important point that every individual brings a unique set of needs and concerns to relationships at work. These needs and concerns are shaped by all the events, experiences, and relationships that encompass one’s life. When relationships allow

one to address important needs and concerns, they are valued. When relationships interfere with one's capacity to address those needs and concerns, they are potentially destructive.

A review of the business and education literature reveals that there are *six primary functions served by an individual's leader network*. These include *acquisition of information and knowledge*: Garber's (1991) analysis of the networking of school administrators was the first research to report that principals and assistant principals in rural, suburban, and urban schools do form established patterns of networking to seek information about such topics as allocating resources, staffing, program evaluation, and policy intervention.

A second function highlighted was a *sense of belonging*: Administrators develop patterns of relationships designed to fulfill a need for a sense of belonging. Research has demonstrated that social support relationships that provide a sense of belonging may help combat physiological and psychological distress (Maslach, 1986; Quick, Nelson, & Quick, 1990). Fullan (2001) argues that, in today's society, the success of organizations relies not only on relationships, or the connections between people, but also on how individuals are connected to a moral purpose.

A third function was *appraisal or evaluative feedback*: Feedback can serve many functions. It can serve as a reward and thus motivate performance, and it can serve as a cue useful in regulating behaviour (Ashford, 1986).

A fourth function was *advancement on career*. Portner (1997) reported that rural high school principals tended to place more emphasis on career aspirations within the

principalship. They utilized their network more frequently for career advancements than did their urban counterparts.

A fifth function was *friendship*: According to Fisher (1986), the nature of the effective relationship between members of the organization seems quite important in bringing about successful socialization.

The sixth function was *arousal or transfer of energy*: Cross & Parker (2004) report that “people are much more likely to seek out those who energize them and avoid those who de-energize them” (p. 1). *This literature was used in the conceptual framework for this research to analyze the function served by the leaders’ decision making network.*

As the world becomes more complex, in terms of keeping pace with rapid and continual change, the old industrial paradigm of leadership based on the leader-centred worldview is no longer appropriate. The new leadership paradigm for the coming century is a leadership of empowerment which involves the whole group in the decision-making approach, not just those who are designated as leaders (Rogers, 1997; Dyer & Williams, 1987). Although greater time is taken to reach decisions, group members are more likely to support decisions reached through a shared leadership process because they have a sense of ownership of them (Dyer & Williams, 1987). The new leadership is therefore based on relationship building and establishing networks.

Research in the field of education has documented the existence and importance of social networks for school administrators (Duke, Isaacson, Sagor & Schmuck, 1984; Weindling & Earley, 1987; Garber, 1991; Parkay & Currie, 1992; Parkay & Rhodes, 1992; Portner, 1997; Aiken, 2002; Hite & Matthews, 2003). “Far too many educational leaders do

not have someone to turn to; they are without a safe professional support system. Just as there has been found a relationship between social isolation and health risk (Goleman, 1995), leadership isolation is detrimental to the health of leaders and their organizations” (Ackerman & Maslin-Ostrowski, 2002, p. 72). Understanding the development of social network relationships of its employees and the functions served by those relationships has value for an organization as well as for an individual. “Research shows that appropriate connectivity in well-managed networks within organizations can have a substantial impact on performance, learning, and innovation” (Cross & Parker, 2004, p. vii). Formal organizational strategies employed by a school board influence the development of the social network relationships of the participants. According to Cross & Parker, (2004) “Whom you know has a significant impact on what you know, because relationships are critical for obtaining information, solving problems, and learning how to do your work” (p. 11). Only by understanding the network relationships of its employees, can a school board begin to assess information flow, diffusion of best practices, acquisition of resources, and adaptability to change (Silins, Zarins & Mulford, 2002).

Social network focuses on patterns of relations among people, organizations, states, etc (Wellman & Gulia, 1997). Proponents of social network theory (Granovetter, 1982) describe social relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. There can be many kinds of ties between the nodes.

Relations

Relations (sometimes called strands, links or ties in network mapping) are features of networks characterized by content, direction and strength. Relations are the discourse between people. The content of a relation refers to the resources that are exchanged. In a school administrative context, pairs exchange different kinds of information, such as communication about administrative, personal, policy and work-related or social matters. A relation can be directed or undirected. It can also be one-way or reciprocal between people/actors/nodes in a system. For example, one person may give social support to a second person. There are two relations involved here: giving support and receiving support. Alternately, actors may share an undirected friendship relationship, that is they both maintain the relationship and there is no specific direction to it. The relationship may be categorized as unbalanced when one actor claims a close friendship and the other a weaker friendship, or communication is initiated more frequently by one actor than the other. Relations also differ in strength (Marsden & Campbell, 1984). With respect to communication, pairs may communicate throughout the workday, once a day, weekly, or yearly. They may exchange large or small amount of social capital. They may supply important or trivial information. Such aspects of relationships measure different types of relational strength (Granovetter, 1982). We can also describe the link by type. For example, the Shared Service Leadership Organization Case Study findings found that network leaders present *4 types of relationships: (1) bureaucratic/functional; (2) knowledge exchange; (3) personal support and (4) technical/process* (Kowch, 2013).

A tie connects a pair of actors by one or more relations. Pairs may maintain a tie based on one relation only, e.g., as members of the same organization or attending conferences together. Thus ties may also vary in content, direction and strength. Ties are often referred to as weak or strong. Ties that are weak are generally infrequently maintained, non-intimate connections. Strong ties include combination of intimacy, frequent contact, and kinship, as between close friends or colleagues. They can be maintained in face to face or virtual contact (Granovetter, 1974). *In this study, few reciprocal links among the school leaders was found to exist, indicating weak relationships in the system. With weak ties between the administrators, the network structure constrained the decision making and overall implementation process occurring district wide.*

Medium for Maintaining Relations

Nohria and Eccles (1992) argue that although the increased efficiency and ease of use of electronically mediated exchange offer the temptation to replace relationships based on face-to-face interaction, the viability and effectiveness of an electronic network will ultimately depend on “an underlying network of social networks based on face-to-face (FTF) interaction” (p. 290). They point out three major differences between face-to-face (FTF) interaction and electronically mediated exchange. First, in face-to-face (FTF) interaction, participants “are always co-presenting- at the same time and place” (p. 293). The lack of co-presence in electronically mediated exchange liberates participants from time and space, and means that all kinds of social context clues are filtered out.

Second, face-to-face (FTF) interaction “captures the entire bandwidth of human interaction. It covers all the senses-sight, hearing, smell, taste, and touch—that provide the

equipment through which individuals receive information...it also captures the full range of psycho-emotional reactions—such as discomfort, ease, attraction... that are so important to human interaction” (p. 293).

Third, “relative to electronically mediated exchange, the structure of face-to-face interaction offers an unusual capacity for interruption, repair, feedback and learning” (p. 293). Face-to-face interaction makes it possible for two people to be sending and delivering messages simultaneously. “All of these differences between face-to-face electronically mediated exchanges have several important implications for dyadic and group interaction, and hence for the effectiveness of any social organization” (p. 294). These implications include how quickly and completely roles and decision-making can be established within the organization, how well actors resolve issues, how quickly and effectively can collective action be mobilized, and how robust is the structure of relationships. Although electronically mediated exchanges can increase the range, amount, and velocity of information flow in an organization, Nohria & Eccles (1992) believe that it is vital to maintain a critical ratio of face-to-face and electronic interactions (p. 304). Wheatley (2005) agrees stating that technology is only a supplement to the need to be together in the same physical space from time to time. There is no substitute for being together,...” (p. 174). *This literature was used in the conceptual framework to determine by which medium the administrators maintained their decision making relations during the implementation of the district wide policy (Research Question 2.a).*

Network Analysis Techniques

Social network analysis is increasingly used in the study of policy implementation and school leadership (Balkundi & Kilduff, 2006; Brass, 1984; Fernandez, 1991; Frank, Zhao & Borman, 2004; Frank & Zhao, 2004; Friedkin & Slater, 1994; Krackhardt, 1990; Ogawa, 1994; Pitts & Spillane, 2009; Spillane, 2005). Others used a mixed case study methodology that relied on social network analysis in studying educational change involving technology (Daly, 2010; Laat et al., 2006; Palonen & Hakkarainen, 2000; Penuel et al, 2009; Shen et al., 2008).

Social network analysis is helping in identifying patterns of relationships between people who are part of a network. It may assist researchers in the analysis of these patterns by illuminating the “flow” of information and/or other resources that are exchanged among participants. In this research, social network analysis produces results that may be used to further investigate aspects of the effects that these relationships have on the people that are part of the network. Using social network analysis, the environment can be mapped as patterns of relationships among interacting members (Wasserman & Faust, 1997). Social network analysis offers a method to focus on relational data, as distinct from data or attributions where the focus is on the characteristics of the individual. The network patterns generated by social network analysis may form the basis of many further investigations. The unit of analysis in social network analysis is not the individual, but the interaction that occurs between members of the network. Social network analysis allows researchers to visualize the network based on the presence and absence of connections between its members.

The network perspective may be complemented by studying the content of the exchanges between the participants. The use of content analysis (Gunawardena et al., 1997; Hara, Bonk & Angeli, 2000; Henri, 1992) can provide insight into the nature of the content of communication among the participants. This can then augment the perspective gained by using social network analysis to focus on network connections. These may vary in content, in direction of information flow, and in strength (network connections can be weak or strong, depending on the number of exchanges between participants).

When applying a network perspective, social network analysis can be used to provide an indication of *cohesion* of a network. The two key indicators of social network analysis are *density* and *centrality*. Density provides a measure of the overall ‘connections’ between the participants. The density of a network is defined as the number of communicative links observed in a network divided by the maximum number of possible links and can be thought of as how tightly knit a network is (Scott, 1991). This varies between 0 and 100%. The more participants connect to one another, the higher the density value of the network (Borgatti, Everett & Freeman, 2000; Scott, 1991). A dense network, meaning one with a high percentage of ties, is thought to be able to move resources more quickly than a network with fewer ties (Scott, 2000). The researcher measured the level of reciprocity between the administrators to establish the percentage of reciprocal relationships within each administrator group as higher levels of reciprocity have been associated with increased organizational performance and knowledge exchange (Kilduff & Tsai, 2003). Centrality is a measure that provides us with information about the behavior of individual participants within a network. Centrality indicates the extent to which an

individual interacts with other members in the network (Wasserman & Faust, 1997). Using this measure, we can uncover who is a central participant of a particular network. Centrality has been thought of as an index of activity (Freeman, 1979). Highly central actors in a network have increased access to resources and a highly potential to create new linkages that may enhance organizational capacities (Stuart, 1998; Tsai, 2000). Those who are less central to the organization may be on the periphery and receive less information and often do not have the opportunities to gain from the resources and information held by those in more central positions. These less central individuals are more likely to receive only the resources deemed necessary by those in a more centralized position (Burt, 2000), thus potentially restricting their perspective of the overall organization. This can be done for each participant by measuring the number of connections with the other members and generating “*in-degree*” and “*out-degree values.*” In-degree centrality is a form of centrality that counts only those relations with a focal individual reported by other group members. Therefore, it is not based on self reports (as is the case with out-degree centrality) (Borgatti, Everett & Freeman, 2000). In this study, in-degree measures provide information about the number of people who considered the participant important to their decision making. Out-degree gives an indication of the number of people with whom the participant considered important to their decision making. Centrality can be considered a point of intersection in which the person in the center of the intersection is able to disproportionately and more quickly amass resources, thus allowing this central individual to influence the network by determining where the resources and information flow (Raider & Krackhardt, 2001). *Betweenness* is a part of centrality measures. This network characteristic is a descriptor of

the extent to which a particular network reaches around a node or person. A high betweenness indicates a node or person in the middle (of many in the network) and, can be a powerful gatekeeper. It is also an indication of any particular actor or cluster of actors to make new connections with other leaders in the organization.

Social network analysis can also be used to visualize the network connections by creating a graphical representation called a sociogram. A sociogram is a representation of all participant connections in a network. The participants are represented as “nodes” and the connections are visualized with lines between the nodes. In this way, one can examine the nature of interactions within the network and how individuals are positioned within the network to play more central or more peripheral roles in the interactions of the group. Visualizations of social networks can show whether interactions are occurring between all members of a group or whether some group members are communicating more (or less) with other specific individuals (Haythornthwaite, 2002).

Rationale for using Social Network Analysis

The social network analysis offers a method for mapping group interactions, visualizing ‘connectedness’ and quantifying some characteristics of these processes within an organization. This technique is used commonly in sociology and organizational studies, but there is a growing interest among researchers to apply social network analysis to study group interaction, communication and dynamics (Haythornthwaite, 2002). The researcher will now briefly summarize some recent studies in computer supported collaborative learning environments to apply social network analysis along with a multiple case study. Haythornthwaite (2001) showed that during class communication in a computer supported

collaborative learning environment there was a tendency to interact more as teams within the network. Dimitriadis, Rubia, Gomez & de la Fuente (2003) found that the density of a network was affected by the teacher's presence. Reffay & Chanier (2003) illustrated that social network analysis can help study the cohesion of small groups engaged in collaboration as a way to locate isolated participants, active subgroups, and various roles of the participants in the interaction structure. Reuven, Zippy, Gilad & Aviva (2003) found that in a structured, asynchronous learning network (as opposed to an unstructured open discussion forum) the knowledge construction process reached a high level of critical thinking and the participants developed cohesive cliques. Nurmela et al. (1999) used social network for analysis in a mixed case study to study participation in collaborative learning activities such as knowledge building and acquisition. Cho, Stefano, & Gay (2002) used similar methodology in an educational context to identify central, influential actors in an organization. Daradoumis, Martinez-Mones & Xhafa (2004) used the same methodology to assess participatory aspects, identify the most effective groups and most prominent actors to monitor and assess the performance of distance learning groups. UCINET is a social network analysis software package used to analyze the data derived from relational data in order to visualize the structure of the network. For this purpose, this study focused on the cohesion of the network (Scott, 1991; Wasserman & Faust, 1997). The researcher conducted density and centrality measures and created sociograms based on the data sets. Laat et al. (2006) contend that it is critical to use a combination of content analysis, interviews and social network analysis to fully understand the processes and relations that are present in large organizations. This approach enables researchers to track the

relationships between the group members, the nature of their relationships and the participants' experiences. They suggest that future research would benefit from a multi-method approach in which analysis of data is used to draw a more complete picture and deepen our understanding of the relations. According to Daradoumis et al. (2004) evaluating a collaborative learning situation is a very complex task. One has to consider a variety of aspects and integrate several analysis techniques, data and tools into a mixed evaluation method. They used a mixture of methods to complement their findings to "achieve a more objective interpretation." This research study supports this conclusion.

Conducting a review of social network theory was important to this researcher because it had been determined by Silins, Zarins, & Mulford (2002) that understanding the social network relationships of its employees can enable a school district to assess its organizational information flow, diffusion of best practices, acquisition of resources and adaptability to change. As well, this researcher sought to identify decision making that may not be bound by organization formal structure (roles, reporting lines) and this method is known to describe interaction among leaders in complex systems.

In its simplest form, the social network in this study will be a map of all the relevant ties between the administrators found within the Nova Central School Board. It will focus on the nature of their relationships and ties amongst each other and with other actors within the network. This study will describe the network of relations searching for the patterns in such networks and discover what these patterns, links and relations mean to the administrator's decision-making. This researcher interviewed 21 participants involved in the decision making process related to the district wide videoconferencing policy. Eleven

were rural principals, five were urban principals, and the remaining five were district administrators. The findings from the social network were analyzed using the Ucinet and NetDraw software. It includes a summary of the findings from each interview, followed by supporting qualitative commentary, including key quotations.

Dyadic Data Analysis

In network analysis, a dyad is a unit of analysis that comprises a pair of individuals and the ties that define their interactions. Consider a group of four people: A, B, C and D. For such a group, there are six unique pairings: AB, AC, AD, BC, BD, and CD. Within each pair, there are four possible interaction patterns. For example, A could initiate contact with B while B does nothing (an asymmetric outbound tie with respect to A), B could initiate contact with A while A does nothing (an asymmetric inbound tie with respect to A), both A and B could initiate contact with each other (mutual ties), or A and B could both do nothing (a null dyad). Because a null dyad can be characterized as mutually null, both mutual and null dyads are examples of the more general category of reciprocal dyads. The objective of a selection model is to predict the likelihood of observing a particular pattern of interactions in a dyad according to individual and dyadic properties.

Factors that are associated with the pattern of ties in a dyad fall into two categories: individual-level factors and dyad-level factors. Individual-level factors are measures of each of the individuals involved in the dyad. Individual-level factors include demographic measures, such as race, gender, and the number of years working in the organization or the profession. Dyad-level factors are measures of the pair, typically reflecting similarities and differences among the two individuals, such as whether their gender or race is the same, or

the difference in the number of years the two individuals have worked in the organization or the profession. In any given network system, each of the factors discussed above may affect the formation of ties. In other words, the outcomes of network selection-the observed interaction patterns within the sample of potential dyads in the network-depend on a combination of individual attributes and dyadic measures of similarity or dissimilarity. Dyadic analysis yields valuable insights into the structure of ties between pairs of individuals in a social system. It is expected that the dyadic analysis proposed here will provide a description of factors associated with network selection among leaders in the Nova Central School District.

As this study focuses on the functions and characteristics of decision making networks experienced by interaction among school leaders in response to a division wide school technology policy, it is important to relate the role of decision making network in a change process such as technology integration. Papa (1990) argues that bonding is an important part of the network relationships in that it facilitates the exchange of information and knowledge. In studying the introduction of a new computer technology, Papa discovered that the productivity following the change, as well as the speed at which the new technology was learned, were positively related to the interaction frequency, network size and network diversity of the employees in the organization. As change and technology is a focal point of this study, it is important to turn our attention to technology and specifically, its role as a change issue in education.

Technology as a Change Issue

McLuhan, 1964 states:

With automation, it is not only jobs that disappear, and complex roles that reappear. Centuries of specialist stress in pedagogy and in the arrangement of data now end with the instantaneous retrieval of information made possible by electricity. Automation is information and it not only ends jobs in the world of work, it ends subjects in the world of learning. It does not end the world of learning. The future of work consists of learning a living in the automation age....(p. 87).

For school administrators to provide effective leadership in their schools and communities in the early years of the twenty-first century, they must possess knowledge and understanding of the issues and the capabilities of technology in education as well (Petrides & Guiney, 2002). This is important to the researcher in this study because a video conferencing policy is the matter around which networks of leaders work to make decisions. So some understanding of technology in education is important for the reader of these findings as well as the writer.

School leaders must also be able to use technology appropriately in the fulfillment of their roles of coordinator and communicator of school programs and activities. When it comes to effective technology integration and implementation, principals and district administrators need to enhance their knowledge and skills in technology leadership (McLeod, Bathon & Richardson, 2011). McLeod & Richardson add that the research literature on effective technology leadership is quite sparse (2011). Our underinvestment in principals as school technology leaders is troubling. Scholarly research has shown that school leadership is “second only to teaching among school-related factors in its impact on student learning” (Leithwood, Louis, Anderson & Wahlstrom, 2004. p. 3). We know that principals’ leadership of both learning and organizational transformation is necessary for significant, long-lasting changes in classroom cultures and student outcomes (Duke, 1987;

Hallinger, 1992). In order for effective technology integration and implementation to occur in schools, we must begin by recognizing that ultimately it is principals, superintendents and district administrators, not teachers, that control all of the resources necessary for systemic change, including vision, money, time, professional development, personnel allocation and internal policy. Yet, most principals currently are struggling when it comes to the extremely complex work of creating and maintaining technology rich learning environments (Levin & Schrum, 2012).

The use of information and communications technology (ICT) has the potential to change the classroom and the role of the teacher. Computer networks and the Internet convey information and deliver resources very effectively. Students and teachers can teach and learn in isolation while at the same time discussion groups can be larger and more diverse (Jacobsen, 2001). Some students learn better when interacting with a machine rather than a person, this can add another resource for the teacher when trying to better support the more diverse learner. The e-learning environment can be open 24 hours a day. Teachers are able to access professional development via the Internet. Educators are now moving toward a better understanding of the potential for online learning and integration of technology into teaching. One of the most profound development in the province of Newfoundland and Labrador in this area has been the development of the government's Centre for Distance Learning and Innovation (CDLI).

Many of the schools in the province of Newfoundland and Labrador have access to more advanced courses using the services of the Centre for Distance Learning and Innovation (CDLI). The centre's mandate is to develop web-based courses and services for

learners of all ages and to facilitate school districts in their delivery. The primary mandate of the centre is the development of web-based senior high school courses and online professional development programs for teachers in the K-12 system (Government of Newfoundland and Labrador).

Literature points to the fact that the field of education is very slow to accept change. From research on policy implementation in education, it is well known that change is either very slow or tends to fail. It takes over thirty years for any given innovation to be adopted by half the teachers in the profession (McGuire & Tyler, 1984).

Some school leaders believe that technology education needs to be diffused into the school system over time. Rogers (1995) states that diffusion is the process by which a policy is communicated over time among the members of a social system through certain channels. Rogers identifies several factors which influence the implementation process for a technology policy. He suggests that policies that possess certain attributes are more likely to be implemented. These include relative advantage, compatibility (is it consistent with the values/ needs of the teachers), complexity (the degree to which technology is perceived by teachers as difficult to use), trialability (the degree to which technology may be experimented with before deciding to adopt or not), and observability (the degree to which results of integration are visible to others).

The New Mexico research revealed that the five most frequently cited barriers to school implementing technology policy were: inadequate budget, inadequate facilities, inadequate resources, inadequate educational programs about technology, and fear of change. The five most frequently cited promoters for *implementing technology policy* were:

personal interest, workshops, visiting technology programs, available grant funding, and school-to-work initiatives (Bussey et. al., 2000). A Newfoundland Department of Education document called TILE stated that technology use is more likely to be sustained when integration occurs across grade levels and content areas and is recognized as a school based effort rather than the special interest of an individual (Zorfass & Remz, 1992).

Petrides & Guiney (2002) state “Although there has been a great deal of recognition in the business world that information and knowledge management can be vital tools in organizations, it is only recently that educational administrators have begun to look at how they might use information systems to assist in creating effective learning environments” (p. 23). Teachers and administrators were often untrained in the proper *use* of technology. This lack of training led to the development of many misconceptions, which eventually leads to barriers and possible underutilization of technology use. Some of the barrier/issues are temporary and can be removed through *training* while others have caused organizational change and require strong *leadership* to overcome. This literature was not used in the conceptual framework for this research, although portions of the literature helped the researcher to understand the decision making factors considered important to leaders in determining how to use the videoconferencing system throughout the district.

Conceptual Framework

The researcher used, for the most part, two models to form the conceptual framework. The Bates ACTIONS model (2000) for determining what type of decisions was made, and the Brazer & Keller model (2006) for determining the four attributes of the decision making. The ACTIONS model (Bates, 2000) was selected as the decision model

for understanding what factors influenced the administrators' decision making while they implemented the district wide videoconferencing policy. In the application of this model, decision makers must consider the impact of their technology decisions on either the students (access, novelty, speed, interactivity); the institution (cost, organizational issues, teaching functions, interactivity); or in some cases, both. This researcher used the ACTIONS model as part of the conceptual framework in this research because the seven factors in the ACTION model were sufficient to allow the determination of decision factors considered in this research. The Brazer & Keller (2006) conceptual framework for educational decision making was selected as the decision model for understanding what *kinds of decisions were made* and *how* others were involved as the administrators implemented the district wide videoconferencing policy. These two models was used to describe and interpret the *content and dynamics* of the decision making network.

A growing literature exists on leader *networks*, which largely focuses on professional networks among various district leaders and between principals and the teachers in their schools. The structural features of these networks, especially their overall interconnectedness (i.e., density) and the position of leaders within a broader web of connections (i.e., centrality and boundary spanning), have been shown to be important factors in understanding a number of processes, especially organizational change (Daly & Finnigan, 2010; Hite, Williams & Baugh, 2005; Honig & Hatch, 2004; Moolenaar, Daly & Slegers, 2010). This research uses a network approach to answer questions regarding *organizational change*. In addition to analyzing network structures and individuals' positions within these structures, social network approach will also address the factors

influencing how individuals form relationships with one another (Friedkin, 1998; Krackhardt, 1992; Uzzi, 1996). Netdraw and Ucinet software was used to map and analyze the social networks.

As such, an overall conceptual framework to describe who in leadership decides what and how they decide is presented in Table 1.0. The framework for understanding the dynamics of the decision making process is Bates’s (2000) ACTIONS model and Brazer & Keller (2006) conceptual framework for educational decision making. The framework for understanding and interpreting the decision making network is Granovetter’s social network theory and the use of social network analysis. Table 1.0 outlines the leadership theories that were discussed in this literature review.

Table 1.0.
Leadership Theories and Models

Research Questions	Theorists and Models used for Description and Interpretation	Model Elements/Criteria	Theorists and Models used to provide analyses
What were the key <i>factors</i> that influenced the administrators’ decision making in regards to the district wide videoconferencing policy?	Type of decision made and by whom: Brazer and Keller (2006) conceptual framework for educational decision making. Factors important to the decision making process: (Bates’s (2000) ACTIONS model)	Identification of the <i>type of decisions made, who made decisions, by what decision making process.</i> Formal and informal organizational structure	Educational Leadership (Leithwood, 2007; Davies, 2005) Principalship (Macmillan, Meyer, & Sherman, 2001; Leithwood, 1988; 1992; Sergiovanni, 1995; 2000) Decision Making (Owens, 1998; Simon, 2001)

<p>What are the <i>characteristics and functions</i> of the decision making networks that rural principals experience when they respond to division wide school technology policy?</p>	<p>Social Network Analyses: Social Network Theory (Granovetter, 1982); Netdraw and Ucinet software to map and analyze the decision making networks</p>	<p><i>Relations and structural features</i> including: <i>Density</i> <i>Centrality</i> <i>Boundary</i> <i>Spanning</i></p>	<p>Technology Integration (Government of Newfoundland and Labrador, 1994; Sharpe, 1996)</p>
--	--	---	---

Chapter 3: Research Methodology

The purpose of this chapter is to describe the methodology used to study how some school and district administrators made decisions as they implemented a district wide videoconferencing policy, an exploratory multi-case study approach is used. Included in this chapter are descriptions of the research methods, case study approach, selection of informants, data types, data collection procedures, data analysis, quality and ethics.

Research Methods

This research is a qualitative interpretive study of decision making in a specific organizational context because little research has been done on decision-making networks in response to a district wide technology policy, and because the research was designed to describe, interpret and to create new knowledge and understanding about this complex process. The nature of the world of the principal is best described by researchers who believe that “reality can only be created by investigation of the phenomenon from the view of the participants through the inquirer’s understanding of the participants” (Schwandt, 1994, p. 120).

This researcher’s careful choice to use a qualitative method of research comes from a keen sensitivity to the nature of the inquiries planned. Specifically, this researcher needed to explore the decision making process of administrators in a complex context where the leaders are aware of technology and leadership. This research was exploratory, descriptive, and speculative. The researcher was not sure of what might be found on administrator decision making in this context until the data was in. The decision to use the

qualitative approach is appropriate for complex studies where unexpected processes and facts may emerge (Marshall & Rossman, 1999).

Qualitative research method allows for the deeper, richer investigation of the phenomenon as a thick description (Geertz, 1973) allowing the researcher to establish the meaning of the phenomenon from the views of the participants (Creswell, 2003). It seeks to understand a particular social situation, event, or interaction (Creswell, 1994; Maxwell, 2004). Qualitative research can heighten our understanding of complex educational situations and lead scholars to identify emerging themes, questions, biases, and pattern for future research (Lincoln & Guba, 1985). Qualitative designs are optimal for investigating human behavior and events as they occur, such as the study of district leaders implementing video policy across the miles in rural and urban contexts. Consequently, since the decision-making network of administrators (in their natural setting) is the focus of this study, a qualitative design is advantageous to capture rich, thick data about this phenomenon (Strauss & Corbin, 1998). This research design was shaped by the nature of the research question (Creswell, 2003; Merriam, 1998; Patton, 2002). The research question guiding this study calls for a qualitative approach since the study is seeking to understand the lived experience of the informant, how meaning is constructed, and the implication for behavior. Qualitative research like this thesis requires the researcher to engage the phenomenon and make sense of it directly or immediately (Crotty, 2003, p. 79).

The researcher explored the complexities in both content and process of decision making made at the individual level within a school district, so the unit of analysis was the individual decision maker. Instrumentation for gathering data in this qualitative study was

not rigidly set in the research design, so a subsequent determination of influential factors unknown at the outset could be discovered. This approach allowed the researcher to find the answers to specific research questions while also gaining a deeper, fuller richer understanding of the complex issues that underlie the surface (Neuman, 2003, p. 139).

Qualitative research allowed this researcher to investigate decision making in schools by using the natural settings of the administrators. With this approach to the research, the researcher was able to understand and interpret how the various informants in their natural setting described their decision making in implementing a district wide videoconferencing policy.

Epistemological and Ontological

The researcher's epistemological orientation of leadership is from a post structural view of organizations, policy and decision making. The researcher understands decision making ranges from a linear cause and effect (classic) to mixed negotiated decision making (Etzioni, 1989).

The researcher's ontological orientation is from a post structural complexivist view of leadership as relations based in an interconnected ecosystem. How the researcher's ontological orientation flows from his epistemological views is if leadership is relational and emergent, we need as leadership scholars a post structural complexivist mindset today.

Case Study Approach

Case study research allows us to understand a complex issue and can expand on what is already known through previous research. Case studies emphasize detailed analysis of a limited number of cases and their relationships. Researcher Robert K. Yin defines the

case study research method as an empirical inquiry that investigates a phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used (Yin, 1984, p. 23). This study was a multiple case study involving 16 principals and 5 district administrators. The case boundaries (Merriam, 1998) were the acting principals and district administrators working in the Nova Central School Board responsible for implementing the district wide videoconferencing policy. Individuals comprised the cases, and as comparative case analysis was required for post hoc analysis; the researcher used the comparative case method to describe trends in decision making (Yin, 2003). Three cases were created from interviews with rural principals, urban principals and district administrators. Originally, the researcher considered the data would produce cases utilizing principals and district administrators as the framework for the multi-case approach, but it was apparent after the first stage of analysis, the data indicated significant contrast between the decision making of the rural principals, urban principals and district administrators. In analyzing the dynamics of their decision making in implementing this videoconferencing policy, the leaders self-identified their peers as being most influential to their decision making. The cases were defined by the participants themselves. Although there were cross relationships amongst the leaders, all the leaders formed clusters around their peers meaning the leaders preferred to work with their peer on this videoconferencing policy. The data generated by the interviews was further triangulated through the analysis of documents and archival records. The case study approach fit the needs of this research because it allowed the researcher to select a time-bounded exploration of a specific event (i.e., the decision

making process involved in implementing a district wide videoconferencing policy) involving individuals in an organizational setting. A case study approach is most appropriate when the phenomenon of interest has a level of complexity that requires multiple data sources and methods to gain an in-depth understanding (Yin, 2003).

Within the qualitative approach, case study is recommended by research methodology experts as appropriate for the study of groups, processes, and events (Creswell, 2003, p. 183). In case study, case(s) can be created so that they are bounded by time and activity and researchers can collect detailed information using a variety of data collection procedures over a sustained period of time (Crotty, 2003, p. 15). The data collected in case study can be based on observation, interviews, or documents (Wolcott, 1990). The case study approach is well suited for natural, holistic, culture, or organization studies (Stake, 2000), such as the investigation that was carried out in this study. The instrumental case approach was a preferred approach for this study because the case analysis allowed the researcher to further explore the decision making of individuals within the organizational context (Stake, 2000, p. 445).

Mixed Methods Research

Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases in the research process. As a method, it focuses on collecting, analyzing and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative

approaches in combination provides a better understanding of research problems than either approach alone. The better understanding results because mixed methods offers strengths that offset the weaknesses of separately applied quantitative and qualitative research methods. It also encourages the collection of more comprehensive evidence for study problems and helps answer questions that quantitative and qualitative methods alone cannot answer. Mixed methods research is important today because of the complexity of problems that need to be addressed, the rise of interest in qualitative research and the practical need to gather multiple forms of data for diverse audiences (Creswell, 2003).

Participant Recruitment: Sample Selection

Initially, the researcher intended to study each key decision maker (principal or administrator) so they could be described and interpreted individually as a case. The plan was to then do a cross-case analysis forming a multiple case analysis for the study on decision making and decision makers (Yin, 2003). First, the superintendent identified a large list (40 people) of significant decision makers to be contacted across the school district. This, in fact identified the possible *population* for the study. Per ethics review (CFREB) requirements, the researcher was then required to invite all names on that large list to offer each a chance to volunteer to participate in the study. Only then could the individuals be contacted (volunteers), sign informed consent forms and engage in an interview where each would also be asked to identify another person significant to them in the work of decision making for the videoconferencing policy implementation. It is in this manner that volunteer participants identified others (and they all did identify others from the original list the superintendent offered, by chance).

In the end, the superintendent agreed to participate and after circulating the recruitment notice throughout the district, twenty other participants agreed to participate by contacting the researcher directly themselves. In total, there were thirty rural principals in the district population of which fifteen were identified by the superintendent as people who mattered in the implementation of this district wide video conferencing policy. Of those fifteen, eleven volunteered to participate in the study (73%). There were thirty six urban principals in the district population, of which ten were identified by the superintendent as people who mattered in the implementation of this district wide video conferencing policy. Of those ten, five agreed to participate in the study (50%). There were thirty district administrators in the district population of which 15 were identified by the superintendent as people who mattered in the implementation of this district wide video conferencing policy. Of those fifteen, five volunteered to participate in this study (33%). In the end, there were 11 rural principals, 5 urban principals and 5 district administrators who took up the option to participate as referents of this survey.

Initially, each decision maker (leader) participant in the sample was intended to be studied as an individual or case, bound by their role (administrator) in a context (school or office) in this study, and as well their relations with significant other decision makers (leaders) they defined were to be studied. However, as seen in the next section, a primary analysis of the findings (inclusive of the dyadic analysis summary shown in the Findings Chapter in this report).

Emergence of the 3 Cases: Rural, Urban and District Leaders/Decision Makers

A primary analysis of the data across all participants showed that these decision maker contexts, jobs and perspectives were distinctly classified into three categories of responses: urban, rural and district. As such the researcher looked at the total network of relations map (Figure 7.0.) and saw that these people were actually three cases of decision makers bound by their context in practice – either rural, urban or district. This was performed using a network dyadic analysis, summarized in (Chapter 4, Table 9.0, 16.0 and 23.0). It was found that these decision makers clearly collaborated to decide on the videoconference initiative as groups of people (cases) bound by their practice contexts, as described by urban, rural and district context(s).

At this juncture in the study, the original study multiple case design bounded by decision maker (individual district leaders/decision makers) was not a good case boundary, in actuality. Participants seemed bound to one another in decision making relationships that were classified as either urban, rural or district (context) predominantly, and so too were their practice contexts and decision making parameters affected by these practice contexts. So the researcher used a dyadic network analysis and found clearly that 3 cases emerged – Urban, Rural and District decision making ‘networks’ or cases that better described who decided what with whom, and why in this particular context. So the study becomes one of a multiple case study approach, interpreting decision makers in three clusters – urban, rural and district. These cases are bound by the nature of the relationships people have across urban, rural and district practice contexts.

The Nova Central School District, which has its central office in Gander, NL, had decided on implementing a district wide videoconferencing policy. The researcher chose the Nova Central School District as the subject organization for the research because it offered rich ground for the exploration of the decision making process relative to a specific intervention. The researcher is also a principal in a different district within the province of Newfoundland and Labrador. Care was taken to ensure that the researcher did not know any of the participants or the district that he was studying.

The researcher has a unique background in education including a graduate degree in educational leadership and professional experience as a rural principal. For the past fifteen years, he has been a rural principal and teacher and brings this unique blend of life experience and academic preparation to the study. This practical experience, in concert with the coursework and theory learned the Doctor of Education Program at the University of Calgary and extended in this study, has given this researcher unique advantages in describing and interpreting decision making in this school district from a higher education scholarly perspective.

The Nova Central School District is one of five school districts in Newfoundland and Labrador. It was formed when the former Lewisporte-Gander and Baie Verts-Central-Connaigre School Boards were merged. It is governed by a fifteen member board of trustees, elected or appointed to represent eleven different zones in central Newfoundland. Nova Central School District covers a large geographic area, ranging from Westport on the Baie Verte Peninsula to Charlottetown, from Harbor Breton to Fogo Island and all points in between. Nova Central School District includes 66 schools located in 50 communities, with

a student population of approximately 13,000 students (see Figure 3.0). The district has a distinctly rural population, with school sizes ranging from eight students to almost 900 students. Eight schools are located in communities that are only accessible by ferries. There are 26 schools in Nova Central School District housing kindergarten to grade 12. The Nova Central School District has a documented history of operations, including annual reports, project reports, and meeting minutes, that has provided a rich documentary source of information.

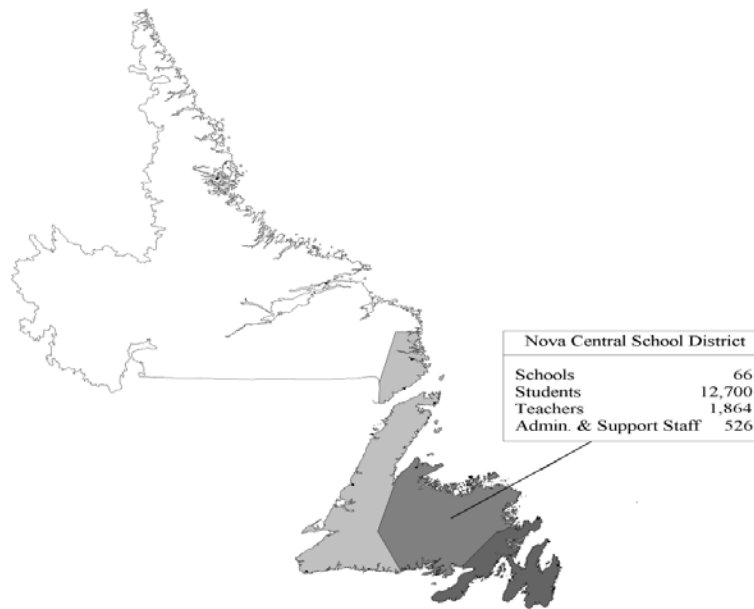


Figure 3.0. Nova central school district geographical boundary.

Participant Profiles

The district group in the study consisted of three males and two females. Approximately three of the district group were in the 40 to 50 year category and the remaining two were in the 50 to 60 year category. Their experience in education varied.

Two of the district group had 30 plus years of experience, two had 20 to 30 years experience and the remaining one had 10 to 20 years experience.

The urban principal group in the study consisted of four males and one female. Three of the urban principals were in the 40-50 year category and two were between the ages of 30 and 40. Years of experience in education ranged from 10 to 30 years. Three of the principals had 20 to 30 years of experience while the remaining two had between 10 and 20 years of experience.

Of the eleven rural principals in the study, eight were males and three were females. Five of the rural principals were in the 40 to 50 year category, five in the 30 to 40 year age group and one was in between the ages of 20 and 30. Years of experience for the rural principals ranged from five to 30 years. Five had 20 to 30 years of experience, five had 10 to 20 years and one fell in the 0 to 10 years of experience category.

The following table summarizes the district, urban and rural participants' profiles.

Table 2.0.
District, Urban and Rural Participant Profile

Group	Profile
District Leaders	5 Participants Gender: <ul style="list-style-type: none"> • 3 males • 2 female Age: <ul style="list-style-type: none"> • 2 are 50- 60 years old • 3 are 30- 40 years old Experience: <ul style="list-style-type: none"> • 2 have 30+ years • 2 have 20- 30 years • 1 has 10- 20 years

	Pseudonyms: Doug, Dylan, Mary, Ron and Jennifer.
Urban Leaders	<p>5 Participants</p> <p>Gender:</p> <ul style="list-style-type: none"> • 4 males • 1 female <p>Age:</p> <ul style="list-style-type: none"> • 3 are 40- 50 years old • 2 are 30- 40 years old <p>Experience:</p> <ul style="list-style-type: none"> • 3 have 20- 30 years • 2 have 10- 20 years <p>Pseudonyms: Tim, Pat, Jordan, Gavin and Jill.</p>
Rural Leaders	<p>11 Participants</p> <p>Gender:</p> <ul style="list-style-type: none"> • 8 males • 3 females <p>Age:</p> <ul style="list-style-type: none"> • 5 are 40- 50 years old • 5 are 30- 40 years old • 1 is 20- 30 years old <p>Experience:</p> <ul style="list-style-type: none"> • 5 have 20- 30 years • 5 have 10- 20 years • 1 has 0- 10 years <p>Pseudonyms: Annie, Jim, Ralph, Nathan, Amy, Frank, Aaron, Tina, Jason, Jamie and Patrick.</p>

Data Collection

An important part of this study was the definition of who, among all the possible people involved, mattered in the decision making process related to this district wide videoconferencing policy. As such, this researcher asked the decision makers to *identify*

each other in responding to video technology policy, to self identify as a sample. This was a stronger way to understand relational dynamics among decision makers than sampling by organization flowchart, which presumes a formal, different kind of organization structure (Kowch, 2003). Researchers refer to this kind of actor nomination as referential sampling, and it has been widely accepted as a sampling method in organizational study and network research (Knoke, 1996). The most important people in the decision making process regarding the district wide videoconferencing policy, as determined by the administrators at Nova Central District according to their own judgment, make this study important because the researcher did not define the decision makers studied in the work; rather the organization did. The data were gathered in three steps:

Step 1 consisted of a preliminary interview with the director of the organization. This step provided the relevant boundaries of the research, including determining the dates relevant to the decision making process (i.e., when the policy was implemented and drafted so that document retrieval could be done), and identifying the balance of research respondents (Neuman, 2003, p. 214). Review and analysis of documentary data, including published annual reports and board minutes from the identified relevant period, followed. The rationale for the first step was to identify organizational parameters (policies, plans); structure, and contact information so that the deeper work could be done in Step 2 to characterize the decision making elements and processes.

Step 2 consisted of personal, semi structured interviews of referred individuals. These interviews specifically gathered the factors that influenced the decision making

process to answer the research question of how the individual came to the decision regarding district wide videoconferencing policy.

Step 3 involved the identification and collection of documents relevant to the decision making process involved in drafting and implementing the district wide videoconferencing policy. The range of documents included annual reports, board meeting minutes, and policy drafting.

Each semi structured interview was tape recorded for accuracy and verbatim transcription. The semi structured interviews ensured consistent coverage of the same questions to delve deeper into specific responses. In the analysis of the findings from this research, the semi structured interview information was triangulated against documentary evidence to add reliability and trustworthiness to the qualitative data (Denzin & Lincoln, 2006).

Field notes were maintained, and summaries were prepared at the conclusion of the interviews. The field notes, in combination with the audio recordings, helped to maintain data integrity. The combination of field notes, recorded interviews, and transcripts was used in a review process with the participants to compare the transcripts to the recordings and the field notes to improve reliability. The participants had the opportunity to review the accuracy of the transcript to clarify ambiguous response data (Neuman, 2003).

Personal semi structured interviews are the primary data source in this research. The context of the interaction was an important part of the personal interview method that allowed the researcher to record additional sensory input for a more holistic experience (Neuman, 2003). For reasons of cost and time, some of the interviews were conducted in

telephone conversations using audio recording for accuracy when transcribing. This was a cost-and-time effective method of reaching the participants who were scattered across the district.

During the interviews, the researcher asked for relevant documents to support the data. In some cases, the interview participants directed the researcher, and in other cases, the researcher developed a specific document list. The researcher`s visit to the district office in Gander provided access to the organization`s archived documents, and district support staff provided additional electronic documents to the researcher.

Truthfulness

The truthworthiness of the data is much stronger when it has been collected through multiple data collection methods. Interviewing and document collection are dominant techniques in qualitative inquiry (Glesne & Peshkin, 1992). These techniques were used in this study.

In order to strengthen the design of the study and to increase validity of these interpretive findings, it is important to plan and strive toward trustworthy results. “*Validity* is used to determine whether the findings are accurate from the standpoint of the researcher, the participants or the readers of an account” (Creswell, 2003, p. 195). Creswell (2003) identifies eight primary strategies, which are available to check the *accuracy* of the findings: a) triangulation of different data sources of information; b) member checking to determine accuracy of findings; c) use of rich, thick description to convey findings; d) clarification of bias brought to the study by the researcher; e) presentation of negative or discrepant information that runs counter to the themes; f) spending prolonged time in the

field; g) use of peer debriefing to enhance accuracy of the account; and h) use of an external auditor to review the entire project.

For the purpose of this study, the researcher has used multiple sources and methods of data collection. Both interview data and documentary data gathering and analysis provide for construct validity. The process of interviewing persons at different positions in the organization provided multiple perspectives to minimize erroneous interpretations. Triangulation of individual interview data was accomplished through the documentary data collection (Neuman, 2003). The research design included protocols to capture the most accurate reflection of the data, including the use of field notes, audio transcription, and participation reviews to capture and record as much as possible (Wolcott, 1994, p. 160).

External validity, or the extent to which the results may be generalized, was not a consideration of this research. The research did not attempt to determine a result that can be replicated or generalized to all school districts because that was contrary to the case situation (Yin, 2003, p. 38); rather, it was a case study of the specific decision making experience in one school district in central Newfoundland.

Reliability

Lincoln and Guba (1985) suggested that the term “dependability” of result should be substituted for reliability, suggesting dependability be achieved by stating the investigator’s position, using multiple methods of data collection and analysis (triangulation), and by describing in detail how data were collected (p. 170).

The use of the semi structured interviews and the referent sampling method allowed for the determination of meaningful context and the convergence of experience. The

context and convergence are two of the more useful questions that can be asked of qualitative reliability (Miles & Huberman, 1994, p. 278).

Data Analyses

For network analysis, this research study used UCINET (Borgatti, Everett & Freeman, 2002) for analyzing data and producing network diagrams. *Centrality* in a network indicates who has the most influential connections to and from other actors. Of the many centrality measures available, this research study used *degree centrality*. Degree centrality was determined by individuals' frequencies of (incoming/outgoing) communication with others. It is assumed that when an actor has a high degree centrality, the actor is playing an important role in the network (Freeman, 1979). While the leader *network data provided quantitative evidence regarding the structure of the decision making networks, interview data offered insight into the nature of the decision making network among the administrators*. The researcher conducted hour-long individual interviews with the administrators using a semi-structured interview guide (Patton, 1990; Spradley, 1980) to provide additional information on the dynamics of the decision making factors around the implementation of the district wide policy.

Verbatim transcripts according to Patton (2002) are essential for qualitative analyses. Patton (2002) stated that is how we stay true to the material and ensure that the reader is hearing the interviewee's voice and not the researcher's voice. All recorded interviews were transcribed verbatim, and each transcript was labeled with the participant's name and date of interview.

The researcher needed to recognize the patterns in the qualitative data and turn them into meaningful categories and themes. To accomplish this, the researcher completed a content analysis. “According to Patton (2002), content analysis involves identifying, coding, categorizing, classifying and labeling the primary pattern in the data. This analysis was used to identify the overall themes and patterns.

The researcher separated the transcripts into three groups: rural, urban and district. The researcher read through all the transcripts jotting down notes in the margins and highlighting words.

Next, the researcher read the individual responses to each question and jotted down key and recurring words. This is what Patton (2002) referred to as pattern recognition. This data analysis was based on an inductive approach. Inductive analysis involves discovering themes and categories in one’s data. The researcher recorded anything that seemed important.

The researcher reduced the data by reading the key and recurring words from each response to each question and coding them. This is what Patton (2002) refers to as open coding. The final step in the analysis was to take the coded key words and put them into themes. This is what Patton (2002) refers to as classifying. The qualitative information was then reorganized into themes. Classification into themes allowed the researcher to compare and contrast the data collected from the different groups of participants. The data was then ready for interpretation.

Data Coding

A frequency count of criteria and decision making features, in concert with the conceptual framework Tables 4.0 (page 96) and 6.0 (page 100) were created based on the number of *occurrences* each model element received (from the participants) from reviewing all the transcripts (raw data). Each time the respondent mentioned the element in context, it was coded as one *occurrence*. Any element may, therefore, have had multiple *occurrences* from any respondent on any question. This research involved the detailed exploration of the factors influencing decision making. The decision making *factors* were in turn made up of *elements*. The examples in the following segments were provided to add clarity to the coding used to report the findings.

Coding for ACTIONS: Factors influencing the Decision Making

The ACTIONS (Bates, 2000) model was developed to provide guidance for organizations when faced with decisions related to educational technologies for the delivery of learning. It reminds decision makers to consider many key aspects of educational ICT decisions, such as user (student) needs, usability, all costs (not just the initial investment), teaching/learning goals and methods, and organizational issues. The ACTIONS framework is not a comprehensive checklist; rather, it is a guide to prompt discussion of specific considerations as they apply to each decision context. The raw data from the interviews conducted for this research were coded and mapped using Bates's ACTIONS model.

Bates (2000) identified seven factors that need to be considered when making decisions about educational technologies. Bates also provided additional detail in the form of questions related to each of the seven factors. These questions were used to determine

the elements associated with each factor. The acronym ACTIONS is summarized as (a) access and flexibility, (b) costs, (c) teaching and learning, (d) interactivity and user friendliness, (e) organizational issues, (f) novelty, and (g) speed.

The factors and associated descriptors (see Table 3.0) were used to code the interview responses. Bates (2000) provided several evidentiary questions and clarifications to assist researchers and practitioners in the application of the ACTIONS model (p. 201). For example, Bates's Costs (B) factor included the consideration of the initial cost of employing the technology, ongoing costs associated with the use of the technology, the cost to learners and other organizational costs occurring as a result of the technology. Bates provided the descriptive questions for each of the ACTIONS model factors. Table 3.0 summarizes the coding table that the researcher used to compile the findings for the individual case responses using the ACTIONS model. Table 4.0 includes samples of the interview responses coded under each of the respective Bates factor categories, with the bolded text linking the statement to the appropriate factor. The data for each of the interviews were organized based on the set of questions as described by Bates and the clarifications presented in Table 3.0 and 4.0.

Table 3.0.
The ACTIONS MODEL (Bates, 2000)

Bates factors	Primary evidence (Bates defined)
Access and flexibility	What is known about the users-or potential users- and the appropriateness of this technology for this particular group or range of users? How accessible and flexible for new and existing learners?
Cost (learner, structure)	Initial, ongoing, organization, users.
Teaching and learning	What kinds of learning are needed? What instructional approaches will best meet these needs? What are the best technologies for supporting this teaching and learning?
Interactivity and user-friendliness	What kind of interaction does this technology enable? How easy is it for the user to use?
Organizational issues	What are the organizational requirements and the barriers to be removed before this technology can be used successfully? What changes in organization need to be made?
Novelty	How new and reliable is this technology?
Speed	How quickly can courses be mounted with this technology? How quickly can materials be changed?

Table 4.0.
Examples of Coding (Bates ACTIONS Model, 2000)

Bates factors	Interview example evidence/citation
Teaching and learning	We want a piece of technology that will be an effective instructional tool (Tina Interview, p. 2).
Organizational issues	The policy implementation process in schools must line with the overall district's goals for this technology (Dylan Interview, p. 1).

Note: The bolded text was the phrase that resulted in the coding to the factor as identified.

Coding for Brazer & Keller Conceptual Framework for Educational Decision Making

Brazer & Keller (2006) provided a series of elements and guides for considering educational decision making when implementing change. Table 5.0 presents a summary of these elements which consists of specific decision making regarding the implementation stage as applied in this research.

Table 5.0.
Multiple Stakeholder Decision Making Model (Brazer & Keller, 2006)

Content Factors	Defined elements
Establishing goals and expectations	Includes the setting, communicating and monitoring of learning goals, standards and expectations, and the involvement of staff and others in the process so that there is clarity and consensus about goals. Vision and goals for the ICT policy in the school; easing uncertainty by communicating what is changing and why; setting goals and developing a plan of action for implementation.
Strategic resourcing	Involves aligning resource selection and allocation to priority learning goals. Infrastructure and resources; assigning roles and tasks that will guide the change process within the school; garnering commitment to ensure that there is a high level of ownership in the implementation process.
Planning, coordinating and evaluating instruction and the curriculum	Direct involvement in the support and evaluation of teaching through the technology including both formative and summative feedback. Direct oversight of curriculum through school wide coordination across classes and alignment to school goals. This involves decision making around school scheduling and timetables.
Promoting and participating in learning and development	Formal and informal professional learning.
Ensuring an orderly and supportive environment	Protecting time for teaching and learning by reducing external pressures and interruptions and establishing an orderly and supportive environment both inside and outside the classrooms. This includes monitoring and checking on the progress of the implementation process occurring throughout the school.

Types of collaboration	Defined elements
Type 1	Leader explains rationale for decision to followers when follower motivation and expertise are low.
Type 2	Leader seeks input from followers, makes the decision and explains rationale for decision when follower motivation is high and expertise is low.
Type 3	Leader works as a peer with a group of followers to arrive at a consensus decision when follower motivation is low to moderate and expertise is high.
Type 4	Leader delegates a decision to followers, holding them accountable to meet predetermined goals and standards when follower motivation and expertise is high.
Types of data used in decision making	Defined elements
School learning achievement data	Looking at the results. It includes school and student assessment data (i.e., test scores)
School process data	Looking at what you do to get those results. In includes setting goals, strategies and developing action plan to achieve targeted outcomes.
Perception data	Looking at feedback from its users.

Brazer & Keller (2006) provided examples of evidence for several of the elements and they noted that the specific content of decisions for the change policy was not something that could be identified unilaterally across all organizations, but rather was unique to and defined by the specific change policy itself.

Table 6.0 includes an example of the interview quotations and the coding into the subsequent decision making content category. These explanative descriptions were used as a basis for coding the interview responses.

Table 6.0.
Examples of Coding in Multiple Stakeholder Decision Making Model (Brazer & Keller, 2006)

Factors	Interview example evidence/citation
Promoting and participating in learning and development	As a staff, we would look at decision making in regards to what training needs the staff had in order to be effective in carrying out the changes that the videoconferencing required to implement (Frank Interview, p. 3).
Planning, coordinating and evaluating instruction and the curriculum	There was decision making around who would cover classes for teachers to free up time in their schedules to collaborate with peers working on assessment and developing classroom instructional strategies applicable to the videoconferencing setting (Pat Interview, p. 2).
Type 4 level of collaboration	There are some decisions that require no input . For example, I do the school schedule on my own (Tina Interview, p. 4).
Perception data	The videoconferencing system provides opportunities to be interactive and engaging . We can potentially get students “turned on” by this mode of delivery (Annie Interview, p. 4).

Note: The bolded text was the phrase that resulted in the coding to the factor as identified.

Limitations

Documentary evidence was an important aspect of data collection. There were limitations in documentary evidence because not all of the documents were available or they no longer existed, were not in the same format, or were not consistent in level of detail provided.

The study was limited to one school district. The researcher chose a district that was large enough to acquire the number of necessary participants. The district was also chosen

based on the fact that it was in the closest proximity to the researcher's district. This was a consideration for a number of reasons including minimizing distance from the researcher, as well as economic and time constraints for the researcher in travelling to the district to conduct the interviews.

Delimitations

The researcher's experience as a rural principal helped in interpreting the data. The fact that the researcher do not work for this district allowed him to remain objective when interpreting what it was that informants was describing. Being a rural principal himself, the researcher wanted to be sure that he was able to recognize all the important aspects of the context of the study for all the case groups and not just the rural principals. The researcher's interactions with his supervisor and supervisory committee have assisted him in mitigating this limitation to some extent.

Time and financial considerations required the methods of data collection to include personal interviews, telephone interviews, and telephone with e-mail follow-up. This placed the collection of data from each interview type in a different contextual experience, and that may have had an impact on the responses. The researcher is located on the southwest coast of the island in the community of Grey River which is only accessible by ferry or helicopter. To access the nearest community in the study district, it required the researcher to travel on a two hour ferry ride to a nearby community. Then drive 570 km. This posed travel restrictions (See Figure 4.0.).



Figure 4.0. Geography and travel limitations.

Ethics and Confidentiality

This research was conducted with informed consent and participation of the subject organization and participants, with all the necessary ethics clearances from the University of Calgary Conjoint Faculties Research Ethics Board. The subject organization is a public school district found in central Newfoundland. The identity of the individuals participating in this research was protected to maintain their confidentiality. All of the participants were identified with an assigned pseudonym. The audio taped interviews and the transcriptions have been maintained in strict confidence and held in a secure place. The researcher

destroyed data that might identify individuals but data have been stored in an anonymous format for possible longitudinal research. The final report was written in a descriptive style using aggregated group summary results.

Chapter 4 Research Findings

Introduction to the Findings

The overarching question for this study was: *What are the nature of the decision making processes of administrators that are responsible for implementing a district wide policy initiative?* The study focused on the decision making processes as perceived by the administrators themselves. Using case study research, a qualitative inquiry strategy, the researcher gained an understanding of the decision making network of administrators implementing a district wide videoconferencing initiative.

As outlined in Chapter Three, the data acquired from the participants' interviews described their decision making and decision making network processes as they implemented the district wide policy initiative. Two categories of important leader network characteristics frame the findings and analysis of the decision making of the administrators in the case: (1) *relations: Structural features and patterns* and (2) *decision making dynamics*. The researcher bring meaning to the *relations and its structural features and patterns of the decision making network* using network analysis including the UCINET software (Borgatti et al., 2002) followed by findings on the decision making *dynamics data using Bates's ACTION model (2000) and Brazer & Keller (2006) conceptual framework for educational decision making* and the by discussing the themes and subthemes that emerged from the data through the researcher's analysis.

In this study, 21 participants forming 3 clusters were found to emerge among all of the people referenced who thought each another were important to implementing the videoconferencing policy. This research found exactly three relational network clusters

(Rural, Urban, District) framing the organization from which many district video conferencing policy decision making factors and features emerged. Though rural, urban and district leaders were found in clusters, individual participant (leader) cases are aggregated at the cluster level and presented as relational units as well. To maintain anonymity of the participants-a feature of the research very important to gaining participation in the study-care is taken to aggregate and yet define individual leaders for analysis as well.

To answer the overarching research question: *How do educational leaders describe their decision making in implementing a district wide videoconferencing policy?* Chapter 3 in this study demonstrated how this researcher interviewed five district level administrators, five urban principals and eleven rural principals about their decision making related to the implementation of a district wide videoconferencing policy. The analysis of the data occurred through a lengthy process of transcription, coding and comparison, looking for emerging patterns and themes which eventually formed into themes and sub-themes.

Structure of the Case Study Narratives

The multi-case narrative format provides a venue for the voices of the principals and district administrators to share their perspectives on decision making in implementing a district wide videoconferencing policy.

Each case study begins with a brief description of the group to provide context for the data. The network analysis, followed by findings based on the ACTIONS model and Multiple Stakeholder Decision Making Model are used to provide an organizational structure for the analysis of the data. Although the data were collected from the perspective of each group, the emerging decision making themes focus the analysis on answering the

question: *How do educational leaders describe their decision making process in implementing a district wide policy?*

The Rural Leader Decision Making Network

The Rural Leader Case

Each of the rural leader participants interviewed had a range of teaching and administrative experience. Their schools ranged in size from two students to just over two hundred students. Eight of the schools were located in communities that were only accessible by ferries. Three year school development plans revealed a number of strategies aimed at increasing student achievement by offering programs that meet the needs of the diversity of students.

There were eight males and three females. All the rural leaders *taught* at least one subject. Their experience in the principalship ranged from one year to nearing retirement. The rural leaders' interviews were approximately 60 minutes in length. In this report, the researcher refers to the eleven rural leaders using their pseudonyms: Annie, Jim, Ralph, Nathan, Amy, Frank, Aaron, Tina, Jason, Jamie and Patrick.

Background

When asked to comment on what made their school similar or different from other schools in dealing with the implementation of this district wide policy, the rural leaders used examples from their school underlining the uniqueness of the rural schools.

All rural leaders reported that they spend a *large percentage of their time teaching* multi-grade groups of students. They add that there is *little in the way of administrative*

support for them, as few have assistant principals, and support staff such as secretaries and custodians is part-time employees at their schools.

Only one rural leader cited *isolation* as a descriptor of their school. In fact, rural leader comments in regard to their school mostly focused on the small size of the school, the sense of community, professional development, focus on academics and support for students as key aspects of their rural school. Smallness was seen as an advantage in how it supported close relationships and how staff and students were known on individual basis.

Rural leaders cited a number of factors in *creating a learning environment*. They cited the rural community where they *knew families and children personally* as a factor in creating a good learning environment. Ralph described how he viewed working in a rural community he knew very well and how this benefited his students. He explained:

The *teachers and principal* are able to have a more personal relationship with the students here. All of us live in the same community as these students. We know their brothers and sisters. We know their mothers and fathers (Ralph Interview, p. 1).

All the rural leaders saw *their main responsibility as an instructional leader, but they felt they were denied adequate time* for this most important aspect of their work. The rural leaders pointed out they do not have an assistant principal and unanimously complained about a *lack of administrative support* dealing with all the demands. There were a number of concerns highlighted, including the sidelining of important educational matters to managerial tasks, rising stress levels, decreasing professional satisfaction and unrealistic expectations of rural principals. Rural leaders unanimously agreed that they require additional human resources to enable their workloads to be accomplished.

All the rural leaders pointed out that they *are readily using information and communication technologies* to connect them to worldwide sources of expertise for learning programs, professional support agencies, blogs, district staff and to each other. Patrick comments: "We absolutely rely on technology---in fact, we couldn't do without it. As principals, we meet virtually to save time and travel" (Patrick Interview, p. 2). *Distance learning opportunities* through ICTs allow broader curriculum options and are paramount to enable the transmission of lessons for students through CDLI. Most, and in some cases, all high school programming in the rural schools was offered through CDLI.

All the rural leaders pointed out that this district wide videoconferencing policy had *the greatest impact on their schools*. All their high school students were doing distance education courses. Less than 10% of urban schools in the district had students in distance education. All the urban schools had only their top academic achievers enrolled in distance courses. All the rural leaders reported the videoconferencing targeted rural schools whose staff was further away from the district office. All the rural schools were geographically isolated and over 50% of them relied on a fixed ferry schedule. To attend a one day professional development session required three days of leave.

Five of the rural leaders reported having small isolated rural schools with a high turnover rate of staff. Most of the principals and teachers used the position to gain seniority in the district and then transferred to other positions within the district. This negatively impacted the ability of these leaders to form any consistent and lasting networking.

Description of Rural Leaders' Decision Making Network

The researcher used a number of network analytical techniques to describe the rural leaders' decision making network and its structural properties. These maps (like Figure 5.0. in this study) actually indicate who works with whom, and the directionality of their referent link to another significant co-leader is also important. As an overall structure, these maps indicate the organization structure, if you will, of the decision making network emergent from the rural leaders in the study.

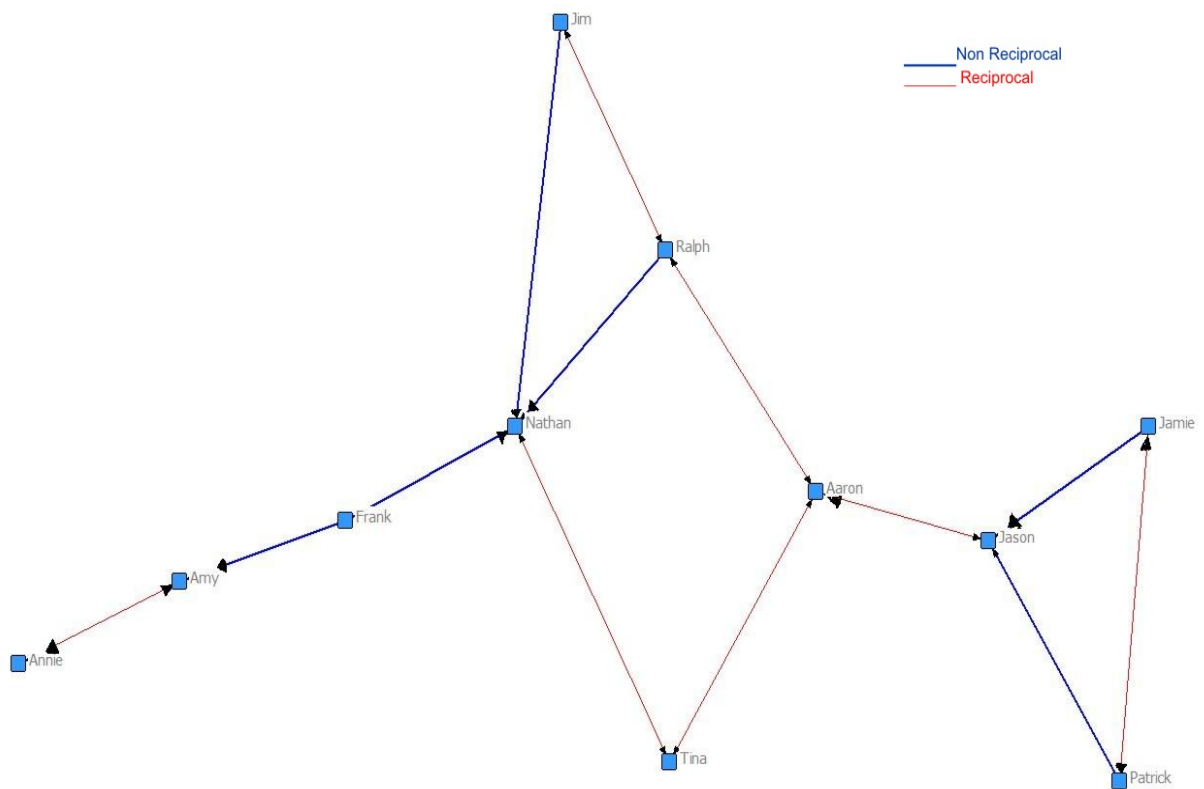


Figure 5.0. Network of rural decision makers.

Network Relationships

Network relationships are the associational links that make up the network (Coleman & Skogstad, 1990). In this section, the Nova Central rural leaders' decision making relations and structural features such as density and connectivity are described.

Structural Features

Table 7.0.

Rural Leader Decision Making Network Structural Features

ID	Degree	Betweenness	Centrality
Nathan	4	22.5	6.2
Aaron	3	21.5	5.8
Jason	3	16.0	5.3
Ralph	3	12.0	5.8
Frank	2	16.0	5.0
Amy	2	9.0	4.3
Tina	2	8.0	5.3
Jamie	2	0.0	4.2
Patrick	2	0.0	4.2
Jim	2	0.0	4.9
Annie	1	0.0	3.2

Degree Centrality

Degree centrality is the number of directed relationships that an actor has. An actor with high degree centrality is generally an active player in the network and is often a connector or hub in the network. Although it does not mean that they are the most connected actor in the network as they may have a large number of relationships, the majority of which might point to low-level actors (Hannenman & Riddle, 2005). In the decision making network above, Nathan has the most direct connections (highest degree) in the network, making him the most active node in the network. He is a “connector” or “hub” in this network. Hubs are individuals in a network with the most influence. Given a network of directed relationships, indegree centrality counts how many relationships point towards an individual; this provides a simple measure of influence (Freeman, 1979). *Nathan has the highest indegree* in the rural decision making network with 4. Common wisdom in personal networks is “the more connections, the better.” This is not always so. What really matters is where the connections lead to and how they connect the otherwise unconnected. Nathan was chosen by Frank, Ralph, Tina and Jim as an influential leader on the policy issue because of his perceived *knowledge and experience*. He has been the *longest serving* rural principal in the district. He had prior experience with implementing school technology policy such as the introduction of CDLI to the schools in the province. The other principals thought of him as being experienced with implementing school technology policy. He was also chosen as a *mentor* to some new principals in the district so many of the younger principals had established a tie with him. They reference having an

established element of *trust*. Nathan also had the largest rural school in terms of student enrolment and staff. This is significant because he had a larger *staff* so his school could offer more teachers to teach courses via the videoconferencing.

In this network, Nathan has connections only to others in his immediate cluster, his clique. It is worth noting that *Nathan had 4 indegree and 1 outdegree. So he gives more advice than his seeks*. Generally, an organization will function better when key decision makers not only are sought after for information and knowledge, but also seek information from the group (Levin, 2011). *Reciprocal ties in these networks mean a stronger organization than non-reciprocal ties*. Nathan only had one reciprocal tie. That is discouraging concern when evident in someone who is an important actor in the rural network.

The principals with the second highest *indegree* were Aaron and Jason (3). They too were chosen by others as important parts of the decision making network on the policy based on their perceived knowledge and experience as well as the fact that the other principals who reference them had established a prior tie with them. These schools were the larger K-12 rural schools within the district and those principals were the most experienced in the rural context. Five of the rural leaders referenced the *leadership style* of the principal as being important. These five rural leaders reported they needed to establish a leadership style that promoted a collaborative culture that encouraged change. They knew they needed to actively develop leadership *capacity* at the school. Principals like Ralph, Jim, Frank and Tina sought input from Nathan on how to promote capacity building amongst their staff in implementing this district wide policy. Likewise, Jamie and Patrick sought *advice* from

Aaron on how to structure time to allow opportunities for their staff to work in teams and to reflect on practices in implementing the policy in their respective schools. Ralph and Tina sought *advice* from Aaron on how to build the capacity of their staff to work in teams in implementing the policy.

A second property to note is there are seven *reciprocal relationships*. These are indicated with double-headed arrows (red) connecting principals. Seven primary decision making relationships were reciprocated---which is a good property in the case of a less centralized network. But if we were to remove the two principals with the highest centrality then the reciprocal ties would be discouraging from the standpoint of knowledge flows, because in a centralized network such strong and reciprocal ties are likely to lead to more insular thinking and knowledge “sinks”—areas with little out-flowing knowledge. As if to illustrate this point, some of these reciprocal ties would exist within isolated dyads in the overall network---for example, if Nathan was removed or the tie was damaged, then Frank, Amy and Annie would be isolated. Likewise, that would be the case if Aaron was removed or the tie became damaged. Patrick and Jamie would seek advice from one another, but would not be sought for advice by others. This means that certain people can be gatekeepers, and that the overall reciprocity of relations is low meaning a thinly tied organization of rural decision makers.

Betweenness Centrality

Betweenness centrality identifies an actor’s position within a network in terms of their ability to make connections to other pairs or groups in a network. An actor with a high betweenness centrality generally holds a favored or powerful position in the network. This

actor usually has a greater amount of influence over what happens in a network (Hannenman & Riddle, 2005). In this particular decision making network, this happens to be Nathan. Not only does Nathan have the most ties, he has fewer direct connections. Nathan has one of the best locations in the network. Nathan plays a “broker” role in the network. The good news is that he plays a powerful role in the network. The bad news from a decision making organization perspective is that he could be a single point of failure. Without this node, many of the school level administrators would be cut off from information and knowledge in district level clusters. Without this node, Amy, Annie and Frank would be cut from information and knowledge. Aaron has the second highest betweenness centrality. Without this node, Jason, Patrick and Jamie would be cut off from information and knowledge. Aaron and Nathan are the rural leaders with the highest betweenness centrality meaning others in the network most commonly must go through them in order to reach each other.

Closeness Centrality

Closeness centrality measures how quickly an actor can access all actors in a network. An actor with a high closeness centrality generally has quick access to other actors in a network. They usually have a shorter path to other actors. This actor is usually close to other actors. This actor also has high visibility as to what is happening in the network (Hannenman & Riddle, 2005). In this decision making network that person happens to be Nathan. The pattern of his direct and indirect ties allows him to access all the nodes in the network more quickly than anyone else. He has the shortest path to all other decision makers and he is close to everyone else. He is able to exchange with others or

disperse information quickly to many others. Nathan is in an excellent position to monitor the information flow in the network. He has the best visibility into what is happening in the network. Nathan is in a position to be a gatekeeper.

The Rural Leader Decision Making Network Centralization

Individual network centralities provide insight into the individual's location in the network. The relationship between the centralities of all nodes can reveal much about the overall network structure.

A very centralized network is dominated by one or a few very central nodes. If these nodes are removed or damaged, the network quickly fragments into unconnected sub-networks. A highly central node can become a single point of failure. A network centralized around a well connected hub can fail abruptly if that hub is disabled or removed. Hubs are nodes with high degree and betweenness centrality.

A less centralized network has no single points of failure. It is resilient in the face of many attacks or random failures as many nodes or links can fail while allowing the remaining nodes to still reach each other over other network paths.

This decision making network can be described as a weak associational network with few reciprocal ties. The network shows weak thin connections and some lonely people. We see smaller relationship clusters anchored by one or two primary targets (Nathan and Aaron). If Nathan and Aaron were removed for example or their tie was damaged, the network would quickly fragment into 2 unconnected sub-networks. Then we would see the existence of “triadic closure”—i.e., there would be triangles in the network. For example, if Aaron was removed or the tie became broken, we would see triadic closure

with Jason, Jamie and Patrick. In the case of primary decision making network, a closed triad in this case would mean that a principal seeks advice from someone who goes for advice to someone else who, in turn, seeks advice from that focal principal. In other words, advice-seeking would be circular. The presence of such circular advice flows is a discouraging property if the goal is to have effective flows of useful knowledge and reduce the likelihood of “groupthink” which would certainly be the case with a school district implementing a district wide policy.

Density

A description of the flexibility and ease of information exchange in a network depended on the network density and connectivity (Krackhardt as cited in Ibarra, 1992, p. 216). The density of a network is simply the proportion of all possible ties that are actually present. Density is defined as the sum of the ties divided by the number of possible ties (i.e. the ratio of all tie strength that is actually present to the number of possible ties). The density of a network may give us insights into such phenomena as the speed at which information diffuses among the nodes, and the extent to which actors have high levels of social capital and/or social constraint (Hannenman & Riddle, 2005). Connectivity was calculated by the degree centrality method. Actor indegrees were good indicators of the formal status that the individual has in an organization, and people with high indegrees were usually people with know-how who gave advice (Krackhardt, 1992, p. 223). In this Nova Central School District network, Nathan (4), Aaron (3), and Jason (3) had the highest indegree, indicating that *these were the actors with the “know-how” in the decision making regarding the policy implementation.* This gives them more informal organizational

influence within the network. The qualitative data from interviews supported this analysis. Other rural principals sought advice from them on issues such as scheduling and troubleshooting. The density for this particular network was calculated as 0.182 which means that 18% of all the possible ties are present. This low network density provided a description of Nova Central School District rural leader network as a *relatively inflexible sparse network structure experiencing difficulty exchanging information.*

The Nature of the Rural Leader Decision Making Network

Table 8.0.
Function served by Rural Leader’s Decision Making Network

Function	Occurrence ranking
Acquisition of information and knowledge	1
Friendship	2
Affiliation or sense of belonging	3
Appraisal or evaluative feedback	4
Arousal or transfer of energy	5
Advancement on career	6

In terms of the kind of support that was provided to the participants through their network with their peer (see Table 8.0.), *the function of acquisition of information and knowledge* was given the highest rating in terms of importance to decision makers in this network. The type of information or knowledge sought by the rural leaders from their peer varied. Ralph reported: “I turn to my rural colleague for assistance regarding questions with scheduling and technology troubleshooting issues in dealing with implementing the videoconferencing policy in my school” (Ralph Interview, p. 3). Patrick added: “I seek the input of my rural colleagues when addressing scheduling concerns regarding the implementation of the videoconferencing policy in my school” (Patrick Interview, p. 2).

Second in importance to the acquisition of information and knowledge, rural leaders rated *affective concern or friendship* as an important function for peer networks. Participants described connections with peers as a source of friendship. Annie commented:

I engage in daily conversations with my rural colleague concerning issues I am having with the policy implementation occurring at my school, especially to vent my frustrations. This daily communication has resulted in the establishment of a close friendship in the profession (Annie Interview, p. 2).

The third function of importance to rural leaders regarding their networks with peers within the school district is that of *affiliation or sense of belonging*. One participant summed it up as “we stick together and help each other out. It is the feeling of collegiality and feeling like you are an important part of a team” (Tina Interview, p. 2). Another participant describes it as “having someone available who lives and breathes the same challenges and demands. It is really like you belong to a brotherhood” (Jamie Interview, p. 4).

The most common function concerns the perceived “knowledge” and “experience” of the leader; however, there were a variety of other functions provided within rural leaders’ accounts. The prevalence of knowledge-based functions is encouraging from an organizational learning perspective, because rural leaders are establishing their decision making networks based upon whom they perceive as having the most useful know-how for implementing the policy. In terms of types of relationships, this decision making network organization evidences predominantly knowledge exchange relations between the rural leaders.

Rural Leaders Choices for Establishing their Network Ties

Having explored some aspects of the structure and content of decision making ties, the researcher now turn to models that predict rural leaders' choices at the group level (what relational characteristics matter to rural leaders when establishing their network ties).

All the rural leaders were asked what influenced their selection of the referent as their primary decision making contact and the dominant response from the rural leaders was the fact that that they had established a prior tie with that particular individual. They have worked with that particular individual for a number of years and have established a professional relationship with them. They knew they were knowledgeable and experienced when dealing with local issues. They also referenced the fact that they have geographical proximity with that particular school so it was important to share ideas on localized problems. The geographical proximity also enabled them the opportunity to meet more frequently in face to face communication. They reference trust in their relationship. For example, Patrick references Jamie as being important to his decision making. This is because Patrick's high school students receive social studies programming via videoconferencing from Jamie's school. As Patrick explains,

It is critical that I consult with Jamie when it comes to decision making with the videoconferencing in my school. He is the principal of the school where our videoconferencing teacher teaches. As a team we need to work together to make decisions in terms of programming, scheduling, professional development and pedagogy. If there is a PD or closure day scheduled in his school but not in mine, we need to make a decision together on how we can ensure the programming is made up. Neither one of us can make those decisions in isolation (Patrick Interview, p. 3).

Decision making isolates like Frank, Amy and Annie were more geographically peripheral in the district. These reasons were coded based upon the presence of specific concepts, which were indicated by exact word usage in the interview (Table 9.0.).

Table 9.0.

Reasons Given by Rural Leaders for Establishing their Network Ties

Reason	Text Example(s)	Occurrence ranking
Prior tie	“Have known”; “worked with them professionally for a number of years”	1
Knowledge/experience	“Knowledgeable”; “experienced”	2
Friendship/trust	“Trustworthy”; “honest”; “someone to talk to”	3
Leadership	“Leader”; “leadership skills”	
Same school type	“Similar school”	
Advancement on career	“Promotion”; “connection to others”; “opportunity to pursue other opportunities within the district”	
Area of specialization and purpose	“Technology experience”; “district role”	

Having established with whom they establish network ties, it is now important to look at the content of the decision making, specifically what types of decision are made and how they involve others. In the next section, how the administrators describe their decision making practices is explored.

Decision Making Process Factors (Bates, 2000): Rural Leaders

Decision making itself, within the network organization found and shown for rural leaders, can be outlined according to the Bates (2000) ACTIONS model.

The rural leaders described their decision making process for videoconferencing policy implementation as a continuous cycle of: acquiring user input (teachers and students); analysis of data from a variety of sources; identification of goals and strategies; reviewing the district goals and concluding with long term education plan for their school regarding the videoconferencing system. They all cited communication, professional development, technology, facilities and school plans as being important consideration to their decision making in the long term educational planning process. Equally important to the rural leaders was the *use of the data to guide decision making*. Aaron commented: “Change efforts like this have the potential to illicit strong emotions, particularly when things go wrong. There is potential for frustration which can lead to making decisions based on judgment rather than data” (Aaron Interview, p. 3).

A concern expressed from the rural principals’ perspective was the opportunity for genuine input into decision making. Tim noted:

If the district administrators already made a decision, then they simply needs to tell us what direction we’re going. Don’t ask us for input. If there is genuine opportunity for us to shape the direction we’re going, then let’s have the dialogue and we’ll give you our best wisdom (Tim Interview, p. 3).

The rural leaders reported that the specific process they use in their daily decision making depends on careful considerations of such factors as *the content of the decision, the time line, and the amount of discretion* from district office.

Factors influencing Rural Leader Decision Makers

The data collected regarding what factors were considered most important in their decision making in regards to implementing the district wide videoconferencing policy by

the rural leaders in their respective schools is presented in Table 10.0. with the *Bates* (2000)

ACTIONS model factors.

Table 10.0.

Decision Making (ACTIONS) Parameters for Rural Leaders (Bates, 2000)

Factor	Rural Leaders	
	Frequency of occurrences	Occurrence ranking
Impact on learners	96	1
Access (by learners)	75	2
Costs (relative/absolute)	65	3
Organizational impact	43	4
Degree of interactivity	25	5
Speed	14	6
Novelty	2	7

Overall in this rural leader network, learner impact from the videoconferencing influenced decision making the most, while costs and access to education factors are second and third in importance.

Impact on Learners

Rural leaders acknowledged that they had a responsibility to the Department of Education, their school district and parents, but the main factor that influenced their decision making in regards to the implementation of this videoconferencing policy was its impact on student learning. Students were the most important stakeholder in the work done in the schools. Student learning was the focus of activity in the schools. As Nathan commented, “We have to give students the very best we can” (Nathan Interview, p. 2). Ralph agreed, “Our decision making has to be in the name of students’ learning” (Ralph Interview, p.1). Jim described his decision making approach as: “We are accountable to the

kids in our community and every decision that we make at this school is made in the best interest of those kids.” (Jim Interview, p. 2)

Frank commented, “As administrators we all have to use our professional knowledge and experience to make the best decisions in the interest of children” (Frank Interview, p. 2).

Tina explained:

I think the teachers know that their job is to help kids grow and learn and they know what their curriculum outcomes are and that’s the number one part of their job regardless of the mode of course delivery. You use that framework to make informed decisions (Tina Interview, p. 2).

Patrick adds:

We are accountable to cover the curriculum according to the Department of Education. We are accountable to our school district to make student learning a priority and improve student learning. We have a responsibility to our learners (Patrick Interview, p. 3).

Jamie comments, “As a principal, I feel more accountable to the students and the parents.

Our responsibility is to teach students the best we can” (Jamie Interview, p. 2). Aaron commented on the resistors:

Some of the teaching staff struggle with such a change. This mode of delivery is outside their more traditional approach. It can be a tough attitude to work with, but I think if they see the results as far as improved student learning then it’s not a tough sell (Aaron Interview, p. 3).

This study has shown that the greatest factor in decision making is the leader perception of the potential or existing impact on teachers and learners. These rural decision makers reported that their schools were most impacted in the area of offering course selection. Most urban schools had appropriate staffing to offer all courses on site. The rural

schools were the ones utilizing distance education to cover their high school programming.

“As a district, we need to ensure that this technology policy can accommodate the different learning needs of the students using it” (Ralph Interview, p.1). Amy adds:

I admit that all the Bates’s ACTIONS factors are important and worthy of consideration when making any decisions regarding the videoconferencing policy. But for me the purpose of this policy is to expand the course options for my students through offering courses using video conferencing. The other important use is its implications for staff professional development. Based on those two important uses, then the other factors are secondary to considering its impact on users. If we can’t get it right for the learners, then it simply isn’t worth having it in our schools (Amy Interview, p. 3).

Tina added:

The top priority for me has to be its impact on the teachers and learners. We want a piece of technology that can benefit the entire school (enhanced staff development and student education). So if this piece of technology isn’t fulfilling that purpose then it simply goes from being an effective instructional tool to a dust collector. Considering the time and money that is going into this policy, we can ill afford to let that happen (Tina Interview, p. 2).

Jamie added: “I think my staff has a common goal. The most important thing to us is our students. Our goal is to want to better the education of all our students and ourselves as professionals” (Jamie Interview, p. 2). Because of this, they felt it was important that staff and students offer their input into the decision making process.

Access by Learners

Access by learners was the second highest decision making factor considered by the rural leaders in this study. For the rural leader in this study, this involved creating a learning environment specific to the students in their care. They took pride in the positive culture of learning that personalized learning for students in their school. Tina described the

culture of learning in her school as focusing on creating a learning environment with adequate resources and support for all students. She stated:

We need a commitment to students and working with them and putting the resources in place to make sure that they have success. Everything I do goes back to teaching and learning. I try to model it and I expect my teachers to model it to their students. (Tina Interview, p. 4)

For the rural principals, it was about creating opportunities for students. Jamie emphasized student engagement in learning as a critical factor in successful implementation of the videoconferencing policy. He stated, “We need to create a virtual environment using this videoconferencing equipment where students engage in creative critical thinking and problem solving” (Jamie Interview, p. 3). Patrick spoke about a culture of learning with adequate resources and an environment focused on student learning as critical in implementing the videoconferencing policy in his school.

All of the rural leader decision makers stressed the importance of their school providing students with adequate opportunities to meet high standards. Various programs and supports were established in the school to accommodate the learning needs of the students. Ralph commented: “As a district, we need to ensure that this technology policy can accommodate the different learning needs of the students and teachers using it” (Ralph Interview, p. 3).

Also important to the rural decision makers was a *concern for the nature of the learning* and the nature of the learners. When deciding if videoconferencing was going to be utilized in course delivery, rural leaders indicated that a number of issues had to be addressed. Specifically, the students had to be prepared to learn that way and the teachers

had to know how to apply good pedagogy practices to the courses. There would have to be additional decision making around what courses could be utilized by this type of technology. The dispersed geographical locations of the schools made providing access to the learning an important factor. For the rural principals in this study, this was the case in both course selection and in providing professional development to staff throughout the district.

To assist teachers with the process of teaching and/or receiving professional development through this technology, the rural principals reported that the school districts must provide the necessary training. “Workshops or in-services can provide the training teachers need to acquire these skills” (Annie Interview, p. 2). In the case of teaching through this technology, those skills would need to be passed on to the students receiving the instruction. “When teachers and students do not have the necessary skills, school and district administrators must ensure that supports are in place that allow the users to attain these skills” (Patrick Interview, p. 3). All the rural administrators stressed the importance of having an awareness of the complexity of the implementation process. They got to understand the fact that it is a process in which key factors are inter-related: namely, the technology policy needed to be implemented on multiple fronts, both materially in terms of appropriate ICT infrastructure and culturally in terms of generating an ethos that values the videoconferencing for classroom practice. Attending to the multidimensionality of the videoconferencing policy implementation allows for an understanding of the ways in which teachers interpret policy and engage in implementation of information and communication technologies (ICT) in their classrooms.

Costs

The rural decision makers in this study considered factors such as geography and cost when making decisions regarding this district wide technology policy. The policy aimed to develop a wireless network of interactive video conferencing amongst all the schools and the district office. It was envisioned to expand current training and professional development initiatives as well as offer extra course selection to schools. They added that the cost of travel to the professional development and meeting session held at the district location was more focused on the rural schools. Because of this all staff were involved in the decision making process. The rural leaders pointed to the fact that even if teachers were not teaching courses through videoconferencing, the district expected that they receive professional development through it, so their feedback was important. Most urban schools had connections to the highway and participants could travel back and forth with a minimal lost of time. Most of the rural schools were accessible only by ferry or plane and lost substantial time for travel. Because of those factors, the rural decision makers felt strongly that this policy must consider the environment and geographical context of the school and its staff.

Cost for the rural leaders meant schools had appropriate infrastructure and equipment to accommodate the technology. Rural leaders stated it was important that both the district and province committed to improvement in bandwidth for rural and remote schools to fully optimize the potential benefits of using the video conferencing technology. Broadband would enable their schools to deliver education in a more collaborative way

moving away from teacher/student relationships towards the development of learning communities.

Having explored the factors that influenced the rural leaders in their decision making on implementation of this videoconferencing policy, the researcher next explores the content of that decision making.

Type and Content of the Rural Leader Decision Making (Brazer & Keller, 2006)

This study of the rural leaders' decision making is primarily focused upon how their decision making affected implementation of the videoconferencing policy in their schools. In this section, the type and content of the decision making data is described and analyzed using Brazer and Keller (2006) Multiple Stakeholder Decision Making conceptual framework under their four attributes: (1) content; (2) type; (3) role of the participants; and (4) structure and type of collaboration.

Content of Decision Making

This district wide videoconferencing policy was a top down initiative from district office. The decision whether to implement or not was not an option for schools. It was a mandatory policy implemented throughout the district. The decisions that were decentralized to schools were implementation decisions that impacted programming offered to their students. Because the course offerings were different in high schools, principals had to make the decisions regarding what courses would be taught through this mode of curriculum delivery and in some schools, what staff members would be teaching the courses. The data regarding the content of decision making made by the rural leaders in regards to implementing the videoconferencing policy in their school as well as the process

used to make that decision is presented in Table 11.0 with Brazer & Keller (2006)

conceptual framework for educational decision making factors.

Table 11.0.

Content of Decisions made by Rural Leaders (Brazer & Keller, 2006)

Decision Making Elements	Decision Making Process	Occurrence ranking
Planning, coordinating and evaluating instruction and the curriculum	Principals in consultation with staff	1
Establishing goals and expectations	Principals in consultation with staff	2
Promoting and participating in learning and development	Both centralized decision making (mandatory district wide PD sessions for staff) as well as decentralized (principals in consultation with their staff)	3

Overall in this rural leader network, the number one ranked type of decision making in regards to implementing the videoconferencing policy in their particular schools was in planning, coordinating and evaluating instruction and the curriculum, while establishing goals and expectation and promoting and participating in learning and development are second and third in importance.

Planning, Coordinating and Evaluating Instruction and the Curriculum

In this study, 7 out of the 11 rural leaders (63%) ranked *curriculum and instructional decisions* as the top decision type guiding their decisions to implement the district wide videoconferencing policy in their school. Decisions regarding curriculum and instructional strategies were being made at the school level within a framework of district goals, while being aware of the individual school's unique mission and needs.

When the rural leaders described decision making around instruction, they referenced how monitoring and modifying their curricular decisions was an ongoing responsibility. Their curriculum and instructional decision making occurred with school scheduling decisions, providing teachers with blocks of planning time and accommodating teachers planning together.

Gavin commented:

As principals we are responsible to follow the guidelines and procedures the school district outlined. We have to make sure we have a handle on what it is that we are doing. As a school we have to follow the policy guidelines. If those guidelines and procedures are too restrictive, then schools lose the flexibility in developing strategies that work in our particular setting. What works well in my school might not necessarily work well in another school and vice versa (Gavin Interview, p. 4).

As an example, Gavin pointed to an incident where he wanted the students in his school to receive a videoconferencing music session (on how to play the accordion) from an elderly man in a nearby community, but the request was denied based on the fact that the elderly gentleman did not have a music teaching degree. Gavin thought such a decision should have been at his discretion as the principal. "I think we lost a valuable opportunity to involve the community in learning and to engage students in ways that are meaningful to them" (Gavin Interview, p. 4). So, rural leaders reported that their decision making in the areas of curriculum and instruction was somewhat restricted.

Establishing Goals and Expectations

In this study, 3 out of the 11 (27%) rural leaders reported decision making around the areas of *establishing goals and expectations* was most important when it came to successfully implementing the videoconferencing policy. They described how they worked

to ensure their school planning process aligned with the school district by engaging with the central office and school staff. Jamie stressed the importance of engaging staff and parents in strategic planning as well as ensuring that they work within the school district's policy requirements (Jamie Interview. P. 3). Rural leaders stressed the importance of being allowed to engage in creative collaborative planning processes in implementing the policy within their respective schools rather than being forced into a "one size fits all" factory model process. Patrick comments:

It is very important that schools use the same goals that are aligned with the school district, but strategies could be unique to different schools. As principals, we should be allowed to take staff through our own process of identifying the strategies that might be unique to our situation" (Patrick Interview, p. 4).

The rural leaders weren't positive in their opinions of the process and procedures accompanying this district policy from district administrators because they didn't view them as necessarily helpful in improving student learning. Their concern was that the regulations, planning and reporting imposed restrictions that sometimes took away from the learning process and learning environment. They felt that this policy became too rule and procedure bound and too focused on formal assessment results. They feared the district would take an administrative, bureaucratic approach to policy implementation.

Their decision making involved developing process and communication tools to ensure stakeholders was informed. The decision to implement this policy was already made at the district level. So the rural leaders felt their decision making started with deciding how to best *communicate* the decision to all those involved. Rural leaders developed newsletters, executive summaries and held meetings to engage staff and parents in a

meaningful way in the implementation and reporting phase. The rural leaders decided that this was best done through working through their *school council*. Frank described the process at his school:

My school engaged in the implementation process for the videoconferencing policy by having regular staff members as a large group. We would discuss changes being made in curriculum and instruction, look at what training needs the staff had in order to be effective in carrying out the changes that the videoconferencing required to implement and reflected upon how well the students were learning through this medium of programming delivery. This information was then communicated to our student council for their input (Frank Interview, p. 3).

Jason valued the collaboration among his staff:

I think the collaboration that goes on in my school makes it a good school. I feel supported by my staff members. I think we have a good camaraderie. This type of atmosphere allows our school to determine what's working and things we need to change. We use a team approach in implementing this policy (Jason Interview, p. 5).

Rural leaders reported that they had an important role to play in ensuring that there was *effective communication*. This was a necessary component for effectively implementing district level decisions. They had an important responsibility to ensure appropriate resources were in place. This involved decision making in areas such as freeing up building space or procuring funds. They also had important decision making around looking at the data to establish workable timelines. These were the “how much” and “how soon” decisions in the context of their local school. Also important to them was decision making around what should be done by whom. It was important that staff members understood what role they needed to play during each phase of the implementation process.

Rural leaders highlighted that it was important to them that the district allow school level personnel to draw on their professional expertise and localized knowledge in making

decisions that affected their school's educational program and instructional system. In terms of videoconferencing programming, school based personnel were the ones monitoring the effectiveness of their programs and their students' academic performance. Decisions pertaining to budgeting, staffing and the instructional program were restricted and controlled by the district policy guidelines. Rural principals felt strongly that because of their close proximity and access to information concerning their students' diverse characteristics, needs, learning styles and performance levels, they were better positioned to make decisions about educational programs in their school than were district administrators who are farther removed from the teaching and learning process.

Promoting and Participating in Learning and Development

Promoting and participating in formal and informal professional development was the third most important type of decision cited by the rural leaders. Rural leaders mentioned that they make decisions regarding opportunities that are available to extend and enhance their staff as well as their own professional learning opportunities related to the technology. As an example, rural leaders referenced working with other principals to facilitate regional or in-house workshops when funding was limited for more traditional training such as attending conferences. Decision making in those situations involved deciding on whether it was through after-school training, release time during the school day or participant driven conferences, principals tried to find ways for their staff to teach and facilitate other teachers within their building.

In addition to taking advantage of the technology expertise in the building, their decision making may involve bringing in outside experts such as consultants to train their

staff on specific technology. It may involve making decisions regarding providing the funding to connect their staff with informal opportunities available through online networked learning spaces using tools such as webinars and social networks.

100% of the rural leaders highlighted that their decision making must be data driven. This leads to findings on types of decision making.

Types of Data used in Decision Making

The types of data used by the rural leaders during the implementation process and for what purposes are presented in Table 12.0.

Table 12.0.

Types of Data used by Rural Leaders (Brazer & Keller, 2006)

Types of Data Used	Decision Making Element
Student learning data (i.e., assessments)	Planning, coordinating and evaluating instruction and the curriculum
Student process data	Establishing goals and expectations
Perception data	Ensuring an orderly and supportive environment

Rural leaders viewed the analysis of data as important activity for staff as it encouraged professional conversations leading to improved strategies or new approaches to the delivery of the educational programming in the school. Rural principals reviewed results with the school council and central office staff seeking their input. Nathan commented: “In our school we examine surveys, assessment and school internal data in order to monitor and potentially adjust our schools’ implementation strategies with this videoconferencing system” (Nathan Interview, p. 4).

Rural leaders perceived the collection of data as an important activity even though it took time from other important issues and duties. They observed school data related to the district and provincial need for data to drive decision making. Despite the concerns with data, all rural leaders *used the data to promote professional dialogue with staff* to develop strategies to improve student learning. They acknowledged that student learning will improve if data is gathered about student work. The data is looked at and analyzed for patterns, strengths and weaknesses. Then, a *teaching style* is adapted for the videoconferencing instruction as a result of the analysis. According to the rural leaders, data analysis was the force that drove their instructional and operational decision making. Jamie provided an example in his school's context:

If student assessment results show that students are struggling with acquiring Music outcomes due to frequent audio delays, then it will be discontinued through videoconferencing. We look at alternate means (such as through CDLI) of having the program delivered to our students (Jamie Interview, p. 5).

Data did generate conversations that could lead to change and improvement in student learning through the videoconferencing mode of course delivery. Many rural leaders commented on the use of school data in conjunction with assessment data to guide decision making about student learning. Patrick explained:

Our teachers have been working on best practices in teaching and learning and creating good assessment practices to be used in the videoconferencing mode of delivery. It is about asking, what can we do to make this better?" (Patrick Interview, p. 3)

When asked what kinds of data they use and what kind of decisions they make with that data during the implementation of the videoconferencing policy, rural leaders highlighted a number of different types of data. All rural leaders spoke of *student learning achievement*

data, which described student and school performance data. Rural leaders referenced using such data to analyze the causes why individual students are not learning, identify barriers to learning that affect students, and seek solutions to correct the problems. Rural leaders described how they looked at student results to make curriculum and instruction decisions. Rural leaders referenced their *school's development plan as a framework* to target the unique needs of students to improve its ability to teach all children and achieve annual academic performance targets. Tina described how one of her students was failing Biology taking the course through videoconferencing so it required a programming change for that particular student. Tina commented:

One of my grade 12 students struggled with receiving Biology instruction through the videoconferencing system. The school had to take a closer look at the learning style of that individual student. It required changing the mode of curriculum delivery for that particular course for that student. We made that decision after analyzing the assessment results for our school (Tina Interview, p. 5).

Rural leaders described school process data, which defined what they were doing to get the results that they were getting. This was important for setting realistic goals and developing an action plan that worked for their particular school. For Jason this process involved looking at the school schedule and programming. Jason commented:

In my school I have onsite instruction from my teachers, CDLI courses online as well as courses offered through videoconferencing. It requires detailed synchronized scheduling throughout the entire school. We have to look at it holistically to see how it all comes together to provide the best opportunities for all our students to succeed (Jason Interview, p. 4).

Finally, they stressed the importance of perception data, which described how the users thought about the learning environment. Rural leaders highlighted that this was important

in the process of monitoring and checking on the implementation in their school. Annie commented:

In my professional experience, learners embrace change if they achieve success early on. It is important that all the users have the tools to be successful using this mode of curriculum delivery. It provides opportunities to be very interactive and engaging. Students definitely need that. Gone are the days of playing Atari games. The video world is made up of x box 360 live and Wii games. The videoconferencing system offers the same kinds of interactivity. We can potentially get students 'turned on' by this mode of delivery (Annie Interview, p. 4).

In evaluating the implementation of the videoconferencing system, the rural leaders cited looking at the frequency of use asking: How often student and teachers used the videoconferencing for learning and teaching purposes?); What type of use exists and what do the students and teachers do when they use the videoconferencing system?); What is the depth of cognitive work enabled by such use (is the videoconferencing system being used for developing critical thinking and problem solving skills?). They paid attention to student and staff usage, learning outcomes and perceptions. They all stressed using multiple forms of data to ground their decision making. They stressed the importance of using local knowledge such as feedback or other input from their own staff and information from parents and students. Although data collection was the responsibility of all staff, it was collected by the principals. This data was shared with district administrators, parents and the general community. The rural leaders stressed the emphasis of all the data collection, analysis and reporting was on learning, growth and improvement for students and staff and not on allocating blame to any particular individual for bad results.

Interestingly enough, the rural leaders reported that the district administrators were dominantly focused on student achievement data. Jason commented:

I think the district's focus on assessment data is understandable given the current policy environment which emphasizes accountability. Regardless of the mode of delivery, teachers must cover the Department of Education's prescribed curriculum outcomes. But too much attention to assessment data may cause the other sources of data to be ignored. It all needs to be analyzed to truly show the full picture. I truly believe that if learners fully embrace the technology, then the improved results in terms of achieving outcome goals will naturally follow (Jason Interview, p. 4).

The rural leaders found that the predominant focus on student achievement was having a deterring effect on the use of other important data streams. It was causing leaders to focus almost entirely on student achievement data and forming a highly competitive environment where schools were seeing each other as competitors in a ranking system based primarily on assessment data rather than as teammates working towards a common goal. This also is a possible explanation for the development of the rural network ties. A relationship between two people is based on the level of exchange they have. The more exchange they have the stronger the relation. All the rural leaders in this study acknowledge that they have more face to face interactions with colleagues in their geographical area. The need for trust and sometimes confidentiality in leader advice-seeking may make face to face interactions an important component for creating strong ties, and this would limit opportunities to develop ties to those individuals within a certain geographical area. This was certainly the case in this particular rural decision making network. Rural leaders felt strongly that they had an important role to play in leading by example for this staff when it came to making decisions based on data. The role of the participants is reported next.

Role of the Participants

The rural leaders reported that as principals they played a critical leadership role by the decisions they made when implementing the videoconferencing policy. The rural

leaders viewed their role as *facilitators* of the planning and reporting process and they understood their role also as a facilitator of the strategic planning process as a critical decision making task. For example, Nathan saw his role as a change agent, constantly moving the teachers toward improvement. He commented:

Teachers help make the decisions in our school. I guide them in keeping the focus on the district goal. As a team, we need to keep in mind the goals of the change process and garnish our collective focus on improvement. It means that we make sure that we develop and implement strategies that allow our students and teachers to become successful and comfortable using this new mode of delivery (Nathan Interview, p. 4).

Rural leaders reported that they had a role to ensure the success across their school for all students by engaging in *planning*. Their role was to make connections between the data, goals and strategies generated at the school level to align them with the district level. Rural leaders reported that they played an important role in ensuring strategic planning was in place with staff involvement.

This study found that rural leaders had a role to play in ensuring that the school district considered context when implementing this videoconferencing policy. These decision makers pointed out that the data showed rural schools were the ones using this technology to avail of professional development and for the delivery of courses to their students. The point was echoed by three of the senior rural leaders was that policy guidelines must not become too restrictive and promote a factory model of strategic planning that pushed conformity. They reported that it was important for principals to develop their own tools to assist in the planning and reporting process to engage stakeholders, particularly teachers. Aaron was somewhat skeptical about the processes

implemented at the district level. He reported the central office staff used a checklist approach reflective of “one size fits all” planning (Aaron Interview, p. 4).

Rural leaders highlighted the professional dialogue many of them engaged in with their staff. They described an open concept plan of the school and open door policy that allowed for more interaction between staff and administration. They reported it was important that they become engaged with staff to bring their views to the central office staff. Most rural teachers did not experience a direct dialogue with the central office staff about planning or data analysis, there was a distance between them bridged by the rural principal.

100% of the rural leaders reported that teachers play a critical role in ensuring that there is successful implementation of the video conferencing system occurring in the classrooms. Teachers needed to aware that teaching is a more intense experience during a videoconferencing lesson than in a traditional lesson, and more time is needed for adequate preparation. The rural leaders reported that it was their role to ensure that appropriate release time and support was available for teachers to develop video conferencing courses. The rural leaders reported that was it was critical that the teacher took advantage of this time. As Jamie reported: “Release time is one piece of the puzzle. It is what the teachers do with that time that will ultimately benefit what students receive in the classrooms” (Jamie Interview, p. 4). Rural leaders reported that professional development needs to be ongoing to help teachers make the transition to online teaching and pedagogical training in addition to the technical training. The rural leaders reported that it was the role of the principal and district administrators to see that the professional development was available. Rural leaders

stated that it was the role of the teachers to learn new teaching strategies, adapt curricula, develop technical skills, and become familiar with a very different learning environment. The rural leaders reported that teachers ultimately decide if this video conferencing policy gets utilized in the classroom as intended, or if it becomes modified or ignored. Patrick commented:

As a principal I communicate frequently with my staff on programming issues regarding the use of the video conferencing system. The reality is I cannot be in every teacher's classroom one hundred percent of the time. So there must be an element of trust that this policy is implemented as being communicated to me by the teachers. It is what is happening within the four walls of the classroom that ultimately decides the success of this implementation (Patrick Interview, p. 4).

The rural leaders viewed the role of central office staff as important in providing curriculum, information technology, human resources and financial support. Nathan reported the central office team supported his school by recognizing the work they had done with implementing this policy and encouraged them to share their ideas with others (Nathan Interview, p. 2).

Parents were also viewed by the rural leaders as a part of the team that needed to increase their understanding. Tina indicated that principals really need to help parents understand what it all means for their kids and their education. Tina comments:

This is a new mode of delivery for parents. They are more aware of the traditional means of delivering curriculum and need to be fully informed about what this type of programming can offer to their child especially in our rural context. That is why it is especially important that we get it right. Technical glitches will cause parents and students to lose confidence in what we are doing (Tina Interview, p. 4).

Rural leaders understood that they needed to share leadership when it came to implementing this district wide policy. Structure and types of collaboration are reported next.

Structure and Types of Collaboration

All of the rural decision makers acknowledge that *who is involved in the decision making process and the how depends on the specific situation at hand*. Tina commented:

There are some decisions that require no input. For example, I do the school schedule on my own. Others are made in consultation with staff. For example, the professional development plans for our school. Sometimes I listen to what the staff is saying before I make a decision, as in cases of student disciplinary action. In other incidents, such as the case with the adoption of a policy like this where all the stakeholders are potentially impacted, we meet regularly as a staff to discuss instruction and student learning and try to come up with the best strategies to adopt for our school. This involves getting input from all the users including the teachers teaching with it, those teachers using it for professional development sessions, students accessing courses through the videoconferencing as well as their parents (Tina Interview, p.4).

All rural leaders emphasized that in their case, there were some decisions that allowed for consultation and others that just had to be made alone. The rural leaders most often described their decision making depended on the context of the videoconference issue at hand. Sometimes they had to make decisions with no input from student support staff. Other instances there were conversations with staff, parents and students where they listened before making their decision. Other times there were discussions with staff and then all come to a consensus. For the rural leaders, the type of decision making depended on the amount of flexibility that the district gave them. “In some cases, we don’t have a choice but the way we are going to approach it may be open to discussion” (Tina Interview, p. 1).

Rural leaders encouraged others to take on leadership roles when dealing with this videoconferencing policy. They shared that they knew the strengths of teachers and through personal conversations asked teachers to lead on specific initiatives. They reported their role then was to support and empower them in these lead roles. All rural leaders expressed that they did not want to be considered dictators, but instead willingly shared leadership.

Jamie commented:

As a full time teaching principal, I cannot be in the classroom monitoring instruction every minute. Success in offering courses through the videoconferencing system will depend on the specific teachers teaching with it. They have the biggest impact on how successful this implementation will be in our school. I have to trust the professionalism of the teachers (Jamie Interview, p. 4).

Rural leaders stressed that they could not lead alone. Tina commented: “As a small school with a vast complexity of duties, I think it is expected that individuals take charge on different initiatives so that responsibilities are spread out rather than the sole responsibility of one individual” (Tina Interview, p. 3). *Shared leadership* was important to the rural leaders. They expressed that it was their responsibility to share the leadership and develop the leadership abilities in their staff and students. Patrick echoed the sentiment of 64% of the principals (7 out of 11) with his comment: “I believe that working collaboratively is the ideal way for a school staff to work on policy implementation. I always encourage teachers to take leadership roles and to make instructional and management decision at the school” (Patrick Interview, p. 4).

Five of the rural leaders in this study shared that they had relatively *small schools* in terms of less than fifty students and fewer than five staff members. Those leaders reported that sharing decision making with this staff was important in the policy implementation

process at their particular school because the context of the decision often changed as new information was collected and received, which in turn often resulted in redefining problems and having to adapt the structure of the decision making group. When it came to this videoconferencing policy, the decision context evolved throughout the course of the school year, as there were changes to school programming and professional development. This resulted in reshaping specific responsibilities and redistributing the roles of existing decision makers. As an example in her school, Tina reported:

At the beginning of the school year, we develop a school plan for the videoconferencing system. This includes specific courses offered as well as professional development opportunities. This plan goes from design state into implementation state, thus creating a new set of roles and responsibilities. For example, one of my senior teachers taught a course on the videoconferencing system one term. Then the next term, they were reassigned as a technical support person. As a small school, roles and responsibilities are often redistributed throughout the course of the year. This means staff may acquire different decision making responsibilities (Tina Interview, p. 5).

This study found that 82% of the rural administrators (9 out of 11 leaders) reported that technology is allowing more troubleshooting capabilities in their schools. For example, programs such as the Bomgar desktop sharing software (2003) are allowing specialists to work on technology issues from a distance. The rural leaders also reiterated the fact that these types of programs are only effective if there is consistent and fast Internet connections, upon which is not always the case in rural settings. Frank commented:

Our Internet is up one day, then down the next. Some days it is so slow that you cannot upload files. This type of inconsistent connection must change if we want teachers and students using the videoconferencing to its full potential (Frank Interview, p. 2).

Frank reported that this highlighted the need for principals to work closely with district technology specialists to upgrade the technology capabilities in individual schools.

Although the rural leaders in this study acknowledged the importance of their role in providing leadership at the school level in adopting a new policy, they did so while stressing the importance of receiving support from the central office staff. Frank commented:

The district expects us as principals to use a collaborative process to obtain feedback from multiple stakeholders across the entire district and to provide direction for district level policies. This means that as principals we are doing two jobs. Our first job is to listen, share and collect information from teachers, students and parents at the school level. Our second job is to provide these multiple stakeholder views as informed input into the district level policies. Our principals' role has emerged to become a leadership position at both the school and district level (Frank Interview, p. 4).

Two of the least experienced rural leaders added that principals and their *staff work in their own schools*; they do not work in other schools in various parts of the district. This allows them an understanding of their particular school needs, but does not allow for a broader understanding of all the needs of a school district. "It becomes important to have central office input, so that by having an understanding of the "big picture" both school and district level decisions regarding the policy could be enhanced" (Jamie Interview, p. 3).

Sergiovanni (1999) also believed that principals cannot encourage change by themselves.

Principals require the support and help of the superintendent and central office staff.

Sergiovanni also indicated that "adoption of change does not occur without an advocate, and one of the most powerful advocates is the superintendent of schools with her or his staff" (p. 264). Nathan commented:

We have to receive direction from the district staff. They have to be the catalyst for getting the information out early through clear communication and also ensuring that there is access to the leadership resources such as itinerants and computer support specialists that are available at the district office (Nathan Interview, p. 2).

Rural leaders described involving stakeholders in the planning and reporting process of the policy implementation. Staff members were engaged in goal setting, identifying strategies and analyzing data for reporting to the district. They worked with staff to ensure that teacher professional development allowed the teachers to acquire the necessary skills to fully implement the videoconferencing policy.

To operationalize their school-based decision making, rural leaders implemented *structures* at the school level to facilitate the involvement of key stakeholders in the decision-making process. All the rural schools embraced collaborative decision making through their *staff meetings* as well as *school councils* which had representation from teachers, parents, support personnel and administration. “I definitely have a nonauthoritarian management style. I pride myself in working as a member of a team. As the principal, I think that it is extremely important that I facilitate meetings rather than dominate them” (Jason Interview, p. 2). The rural leaders did not feel threatened by the strong role parents and teachers played in the decision making process occurring in their schools.

Five of the eleven rural leaders reported providing support to their staff by providing tools to conduct analysis of data, providing substitute time, facilitating professional dialogue to challenge beliefs and gave assignments to take advantage of people’s abilities. Rural leaders described how they tried not to be directive, but acted more

as a facilitator or a leader, rather than a manager. Patrick explained: “I give people assignments and let them work at it. I try not to micro-manage them” (Patrick Interview, p. 2). Tina described how she viewed the role of a leader to provide opportunities for staff to lead. She said: “As a principal, I give people the opportunity to become leaders and give them areas of responsibility” (Tina Interview, p. 3).

The importance of increasing skills in instruction and assessment and understanding of the vision of the policy were highlighted in the rural leaders’ comments. Rural leaders commented on the importance of understanding the needs of their students and then tailoring programs such as this videoconferencing policy to meet their needs. That is why they stressed it was important to collaborate with school support staff.

Rural leaders spoke about their school teams and how they worked together. They were organized according to the tenets of *professional learning community*. Jim described his school team as a mixture of experienced and young teachers, support staff and parents working together on programming for their students. He commented, “We have a partnership with parents so keeping parents informed about their child’s progress, having them involved in decisions that affect their child’s education is really an important part of our school” (Jim Interview, p. 2).

Aaron described how the professional learning community’s structure brought his teachers together to provide an opportunity for adult learning to affect student learning. They develop personal goals and team goals and no longer work in isolation to improve student learning. He commented: “Using professional learning communities allow our staff to talk to each other and to learn from each other. It is about building and supporting

collaborative structures” (Aaron Interview, p. 4). Frank reported he was able to support his staff by increasing their skills in instruction and assessment and understanding of the vision of the district policy. Patrick reported that as a rural principal with a small staff he was better able to know the level of his staff’s ability and experience, so he felt comfortable being able to support their learning and development appropriately.

All the rural leaders talked about the amount of time that was required to work as a professional learning community. They all wished they could give teachers time during the school day to collaborate. They all noted the demands made on the hours of instruction. Tina commented: “To expect everything to happen outside of school hours is not good for anyone. The only opportunity for my staff to work as community of learners is on their own time before or after school” (Tina Interview, p. 2). Reflection time for rural teachers and administrators to improve practice was nonexistence. All rural leaders mentioned that they encouraged their teachers to reflect individually and as a professional learning community but other than the time before or after school, there was no time set aside for personal and professional reflection. “Reflection occurs informally in my school and always on your own time. I truly believe there needs to be time set aside during the school day for reflection” (Patrick Interview, p. 3). The rural leaders felt strongly that it was important that district administrators give them discretionary substitute time so that such *collaborative structures* could be locally planned.

In a similar manner, Fullan (1993) stated that the change process such as the adoption of a policy is extremely complicated and no one person could possibly deal with all its ramifications. He adds that such change is non-linear and one “cannot predict or

guide the process with any precision....instead, success has to be the discovery of patterns that emerge through actions we take in response to the changing agendas of issues we identify” (p. 20). That was a prevalent point made throughout by the rural leaders. It was difficult to predict with any kind of precision all the potential problems that may arise from implementing this district wide policy. Issues such as connectivity, audio and video reception may vary on a daily, weekly or monthly basis. They will also vary from school to school. These factors require a team approach to finding solutions. “Implementing a district wide policy requires a systems approach. For example, the human resource division may need to work with the information technology division to set up technical training” (Jim Interview, p. 3). “As a staff, we need to know that district administrators support us throughout the implementation phase in allowing us to try new things and to make mistakes in the process” (Patrick Interview, p. 4).

For rural leaders any technology implementation process should include measures for evaluating its success. In their respective school, those measures focused primarily on classroom integration and learning goals. An important role of shared leadership for them was this monitoring process be created and monitored with student and teacher input. As Tina commented: “The overall goal of technology usage in my school is not simply making the technology available to students and teachers, but to make sure it is used and used well” (Tina Interview, p. 2).

The sub-theme of (a) capacity building through collaboration emerged from the rural principals’ interview data.

Capacity Building through Collaboration

As rural leaders discussed their decision making practices, capacity building emerged as one of the sub-themes in the data. When they described their decision making practices, it was evident they were building capacity in the people with whom they worked through developing relationships and engaging in opportunities for people to increase their skills in teaching, assessment and learning and broadening understanding of learning and planning processes to improve learning through the videoconferencing policy. Rural leaders focused on building leadership capacity within their school staff. Jason described his school's dedication to capacity building as: "It's building a culture of focus on best practices. It is about creating support and focus on building that capacity amongst the staff who will work with me in implementing this policy" (Jason Interview, p. 3).

Rural leaders discussed having regular staff meetings to discuss pedagogical issues. They highlighted the fact that the staff had input in the decision making in regards to their weekly agenda. A common practice in their staff meeting was to collectively develop a meeting agenda and provide additional opportunities for input and discussion specifically around implementing the policy.

Conversations about relationships with the teachers, students and parents all cited elements of trust and support. The rural leaders had a very strong sense of team within their schools. They identified leadership practices in which both principals and teachers engaged to build positive relationships. Underlying the notion of team was trust. The development of trustworthy relationship was important to rural leaders. They described trustworthy relationships with staff as a foundation of their work. Some of those relationships may have

developed because of the rural nature of the school. Annie stated: “I take pride in the fact that we’re a small school and we know our students, we know our teachers, we know our community” (Annie Interview, p. 2). Annie spoke of how important it was to build trust with teachers. She explained: “I trust my teachers in allowing them to choose the professional development that they want to engage in. It has to line with our ultimate goal of increasing student learning” (Annie Interview, p. 3).

Rural leaders were found to require a *need for contact* with the director and other central office staff to build trust. This was critical, particularly for those rural leaders who were fairly new to their position. One principal commented: “As a new principal to the district, I was rarely visited by district staff. I didn’t know if I was doing a good job or not” (Annie Interview, p. 1). All the rural leaders mentioned their desire to have more contact with central office staff. Terms like support and acquisition of information and knowledge were used to describe why they needed to have that contact. They wanted to understand the direction of the district with this policy and wanted to know they had their support in implementing it in their schools.

Reflections on the Rural Leaders' Case Study

Table 13.0.
Summary of Rural Leader Case Findings

Conceptual Framework	Rural Leaders
Network analysis	
Structural features	<i>Weak associational network with low reciprocity of relations anchored by one or two primary targets. Density of 18%: Relatively inflexible sparse network structure experiencing difficulty exchanging information.</i>
Reason for establishing network ties	Rural principal leaders' choice was based on having established a prior tie. Geographical proximity was an important variable which determine with whom rural principals choose in their decision making network.
Function served by network ties	<i>Acquisition of information and knowledge</i> was the most frequently cited function of their decision making network tie.
Bates (2000) ACTIONS Model Factors	
Factors which influenced their decision making with regards to implementing the district wide video conferencing policy.	The rural principal leaders were most concerned about its <i>impact on teachers/learners.</i>
Brazer and Keller (2006) Multiple Stakeholder Decision Making Model Features	
Content of decision making	<i>Planning, coordinating and evaluating instruction and the curriculum</i> was the top ranked decision for rural principal leaders.
Types of data used in decision making	They used <i>data driven decision making</i> based on <i>student learning, school process, and perception data.</i>
Role of the participants	Rural principal leaders reported the important role of <i>teachers, district administrators and principals.</i>
Types of collaboration	<i>Type 2 and Type 3</i> collaborative decision making involving <i>staff meetings</i> and <i>school council</i> structure.

The rural leader network was found to be a centralized network anchored by one or two primary targets. The density of the network was calculated at 18%. It can be described as a relatively inflexible sparse network structure experiencing difficulty exchanging information. The rural leaders' reason for establishing the network tie was based on having

established a prior tie with their peer. Acquaintanceships or physical proximity was also an important variable. Acquisition of information and knowledge was the most frequently cited function of their decision making network tie.

The rural leaders were most concerned about its *impact on teachers/learners*. The rural leaders acknowledged that the decision to implement this district wide policy was made at the district level. They were limited to making school based curriculum and instructional decisions in terms of determining school based educational programming to be offered through the videoconferencing as well as professional development needs of their staff in implementing it in their schools. They used data driven decision making based on student learning, school process, and perception data. Rural leaders reported the important role of teachers, district administrators and principals in implementing this district wide policy. Type 2 and Type 3 collaborative decision making was used by rural leaders involving *staff meetings* and *school council* structure.

The Urban Leader Decision Making Network

The Urban Leader Case

Each of the urban leaders interviewed had a range of teaching and administrative experience. Their schools ranged in size from three hundred to close to a thousand students and all these schools were located in urban communities. Three year school development plans (School Development Plans, 2006-2009) revealed a number of strategies aimed by focusing first on *increasing student achievement* by offering programs that meet the needs of the diversity of students.

There were four males and one female. None of the urban leaders had any teaching responsibilities because they were full time administrators. Their professional experience in the principalship ranged from ten years to nearing retirement.

Background

When asked to comment on what made their school *similar or different* from other schools in dealing with the implementation of this district wide policy, the urban leaders used examples from their school to underline the uniqueness of the urban schools.

All the urban leaders highlighted a number of challenges that they face in dealing with implementation of the video conferencing policy. Some of those were similar to their rural counterparts, while others were quite different. The urban leaders commented that they work with a large student and staff population. All of the urban schools had more than 30 members on staff. They stressed the diversity found in both their staff (teachers) and student population. Urban leaders also described having to deal with social problems such as drugs, alcoholism and dysfunctional families. Many highlighted that there was a lack of parent involvement with school programs. There was difficulty in coordinating parent teacher meetings. They highlighted issues with parents who have different ideas about how important school is. They all stressed challenges with meeting the wide variety of intellectual and academic needs of the students that required program modifications. Classroom management was a major challenge highlighted by all the urban leaders. They stressed how they deal almost daily with issues such as swearing, bullying, school yard fights and classroom disruptions. They attributed a lot of that to the issue of over-crowded classrooms and 100% of these participating decision makers-leaders acknowledged that

they had the sufficient staffing numbers to offer the full prescribed curriculum. They all used the videoconferencing system to offer enrichment courses to their schools and five urban principals were in their current position for over five years so there was stability in the leadership at their respective schools. They acknowledged working closely with their fellow urban leaders over the past number of years on different district initiatives, including the district wide video conferencing policy implementation.

Description of Urban Leaders' Decision Making Network

As discussed in the literature review and the previous findings on rural leaders, urban leaders clustered together when deciding how to implement the video conferencing policy. As such, their organization of relations in decision making (Figure 6.0.) is a way to understand this sub-organization in the study, much as it was for the rural principal decision makers found in the study.

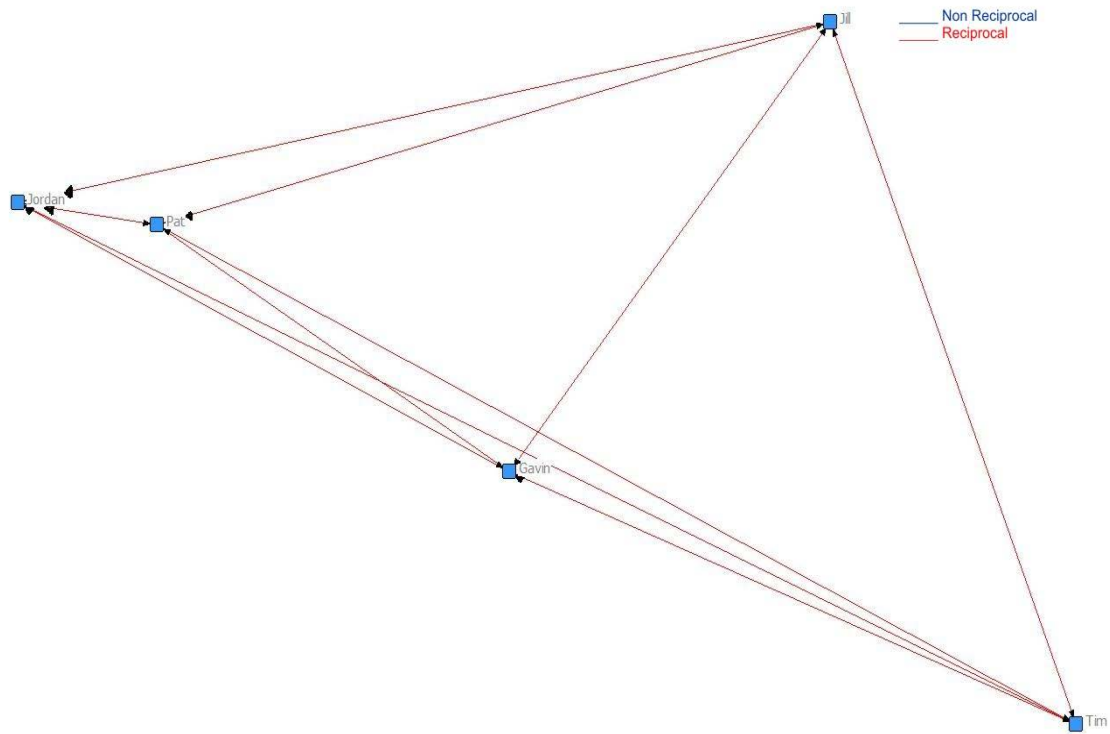


Figure 6.0. Network of urban decision makers.

Network Relationships

Network relationships are the associational links that make up the network (Coleman & Skogstad, 1990). In this section, the Nova Central urban leaders' decision making relations and structural features such as density and connectivity are described.

Structural Features

Table 14.0.
Urban Leader Decision Making Network Structural Features

ID	Degree	Betweenness	Closeness
Gavin	4	0.0	4
Jordan	4	0.0	4
Tim	4	0.0	4
Pat	4	0.0	4
Jill	4	0.0	4

Degree Centrality

In the social network above, all five principals have the same number of direct connections in the network, making them all active nodes in the network. They are all “connectors” or “hubs” in this network.

A second property to note is there are eight reciprocal relationships. These are indicated with double-headed arrows (red) connecting principals. Eight primary decision making relationships were reciprocated---which is a good property in the case a less centralized network like this. It shows *effective information flow* in a small, closed network. Overall the network is quite small and closed, and does not include many people.

Betweenness Centrality

In this decision making network, we happen to find all and only urban leaders identifying each other as primary decision makers on the video conferencing policy. They all lie on the shortest path between every other pairs or nodes. There is no one person that other urban leaders must go through in order to reach each other. They are all interconnected and gatekeepers. This shows that all the urban leaders are equal in their strategic advantage and information control of information. They are a tightly knit group.

Closeness Centrality

In this decision making network, the pattern of the urban leaders’ direct and indirect ties allows them all to access all the nodes in the network as quickly as anyone else. All of them are closely connected to everyone else. They are all in an excellent position to monitor the information flow in the network. They all have good visibility into what is happening in the network. They all have direct ties to each other.

The Urban Leader Decision Making Network Centralization

This network can be described as a very strong associational network with many reciprocal ties. The network shows strong connections. There are no “triadic closures”-triangles in the network. Nodes or links can fail while still allowing the remaining nodes to reach each other. There is effective information flow throughout the entire closed network.

Density

In this decision making network, all five urban leaders had the same indegree (4), indicating that these were all important actors with the “know-how” in the decision making regarding the policy implementation. This gives them more informal organizational influence within the network. The interview data supported this analysis. The density for this particular network was calculated as 1.00 which means that 100% of all the possible ties are present. This high network density provided a description of Nova Central School District urban leader network as a highly dense flexible network structure experiencing no difficulty exchanging information. It is worth noting that this is a much smaller closed network. All of these urban leaders were connected as large high schools. One has to keep in mind that density values tend to be higher in smaller networks; it is, of course, much easier to maintain many connections with a few participants than with very many participants.

Another interesting feature we can from the graph (figure 6.0.) is how tightly knit this network is; no one is left out. Everyone considers everyone else as equally important in the decision making process. This finding is consistent with the high density of this network and the consistent in-degree values (4) of all the urban leaders. The levels of

connectivity and engagement are equally spread out. This is very promising in terms of group cohesion as all the urban leaders are equal participants in the collaborative decision making process without individual participants being pushed to the side by more dominant participants.

The Nature of the Urban Leader Decision Making Network

Table 15.0.
Functions served by the Urban Leaders’ Decision Making Network

Function	Occurrence ranking
Acquisition of information and knowledge	1
Affiliation or sense of belonging	2
Appraisal or evaluative feedback	
Advancement on career	
Friendship	3
Arousal or transfer of energy	

The primary function of the relationships with their fellow urban leaders (see Table 15.0.) was in the *acquisition of information and knowledge* as it pertained to seeking feedback and advice from colleagues regarding similar issues that they may have at the school level when implementing the videoconferencing policy. Tim added: “I regularly communicate with my colleagues at a nearby school to discuss strategies and plans when implementing the videoconferencing policy in my school. It helps when you can share the experience with administrators going through the same process” (Tim Interview, p. 4). Urban leaders shared that they were able to seek out best practices from successful urban schools. It was easy for them to look internally in their district since they were familiar with the successes other urban schools were experiencing through their annual leadership meetings.

We meet as principals at regular regional leadership meetings and talk about what is going well, but also discuss some of the struggles that we are experiencing. I take note of what is being said and by whom. I take note of the good ideas and bring them back to my school to implement (Pat Interview, p. 7).

Second in importance to the acquisition of information and knowledge, urban leaders rated *affiliation or sense of belonging* as an important function for their relations.

Jill commented:

Professional contact with my peers helps me cope with some of the stress that I encounter when implementing the district wide videoconferencing policy in my school. I want to ensure that the videoconferencing system yield the greatest rewards for my students and staff. It helps when you can consult with fellow principals who are struggling with the same types of issues (Jill Interview, p. 5).

Third in importance, urban leaders rated *friendship*. Urban leaders described generating a rapport with the fellow urban leaders in their area. Gavin commented:

After working together for a number of years, you establish a close relationship with your close peer. You develop a genuine concern for not only how they are doing professionally and but also, personally. In many instances, we get to meet and socialize with their family (Gavin Interview, p. 2).

Tim added: “Gavin is my peer one moment and we share ideas off one another. The next minute, he serves as my counselor. It helps when you have that kind of support available” (Tim Interview, p. 3).

Like the rural leaders, the most common function with the urban leaders was the perceived “knowledge” and “experience” of the principal. They too provided a variety of other functions. The prevalence of knowledge-based functions from both the rural and urban leaders is encouraging from an organizational learning perspective because all the leaders are seeking advice from fellow leaders whom they perceive as having the most

know-how for a job-related problem. In terms of types of relationships, it appears to be predominantly knowledge exchange relations between the urban leaders.

Urban Leader Choices for Establishing their Network Ties

Having explored some aspects of the structure and content of decision making ties, the researcher now turn to models that predict urban leaders' decision making choices at the group level (what relational characteristics matter to the urban principals when establishing their network ties).

All the urban leaders were asked what influenced their selection of the referent as their primary decision making contact and the number one ranked reason from the urban leader was based on sharing a similar school type (high school). They referenced sharing similar issues with other urban schools in the district. These particular schools were notified by district office of what high schools throughout the district were offering programming through the video conferencing system. The urban leaders acknowledged that was their connecting point to the other principals. In its initial stage, only those five urban schools were involved in offering student programming through the videoconferencing system. The other urban schools throughout the district were using the videoconferencing only as a source of professional development for staff or to connect with program specialist such as itinerants. These functions were coded based upon the presence of specific concepts, which were indicated by exact word usage in the interview (Table 16.0).

Table 16.0.
Reason Given by Urban Leaders for Establishing their Network Ties

Reason	Text Example(s)	Occurrence ranking
Same school type	“Similar school”	1
Knowledge/experience	“Knowledgeable”; “experienced”	2
Friendship/trust	“Trustworthy”; “honest”; “someone to talk to”	
Prior tie	“Have known”; “worked with them professionally for a number of years”	
Leadership	“Leader”; “leadership skills”	
Advancement on career	“Promotion”; “connection to others”; “opportunity to pursue other opportunities within the district”	
Area of specialization and purpose	“Technology experience”; “district role”	

In the case of urban leaders, the network ties were established primarily based on sharing *similar school type* (urban high school). Initially, these were the only five urban high schools in the district offering programming options via the videoconferencing system. Reciprocal ties between the urban leaders were based on similar school type. Having established with whom the urban leaders seek advice, it is now important to look at the content of their decision making, specifically what types of decisions are made and how they involve others. In the next section, how the urban leaders described their decision making practices is explored.

Decision Making Process Factors (Bates, 2000): Urban Leaders

Decision making itself, within the network organization found and shown for urban leaders, can be outlined according to Bates (2000) ACTIONS model.

All the urban decision makers stressed the importance of obtaining all available information concerning the videoconferencing policy prior to making a decision. They too acknowledge that the decision to implement this policy was handed down to them by district administrators. Their decision making involved deciding which staff to include on the committees and then ensuring those individuals knew what role they needed to play during the implementation phase. Like the rural leaders, they stressed decision making in regards to ensuring appropriate resources was available to allow them to successfully implement the policy in their school. They mentioned the importance of making decisions around identifying appropriate timelines and establishing evaluation checkpoints where local decision making was assessed. Many of the participants were hesitant to rush into a decision without the proper background knowledge. All the participants agreed that all the decision makers involved should understand the policy thoroughly. These participants all stressed the importance of everyone involved following the same procedures and policies with consistency. In the case of the videoconferencing policy all agreed that it was important to have consistency in implementation. One administrator commented “In order for any policy to be successful, there needs to be a high level of information sharing and clear open communication amongst those people directly involved in its implementation” (Jennifer Interview, p. 2).

Urban leaders reported that it was important that they work to align provincial, district and school planning processes and goals. They reported they played a critical role of leadership in the planning and reporting process and worked hard to create a leadership team. They developed a process whereby documents were developed; monthly meetings to

engage in the analysis of assessment and survey results; and how the analysis was used as the school level to plan for goal setting and professional development.

Urban leaders highlighted that *standard policies and procedures* help guide their day to day decision making in regards to implementing this policy. In their schools, all staff members are a part of a professional learning community. Each staff member belongs to their own grade level or subject area professional learning community. Each professional learning community is required to develop and submit to the administration SMART (specific, measurable, attainable, realistic and timely) goals that are developed through the use of assessment data. Only the professional learning community involved with programming with the videoconferencing system were consulted in the decision making process. Interestingly, the urban leaders stressed that it was important to establish that all school based decision making relating to learning technology like the videoconferencing was made by the administration with input from the technology leaders, not the other way around. They felt that a consultation process was important, but ultimately the school based decision making in regards to implementing this videoconferencing policy had to be done by the administrative team.

Factors influencing Urban Leader Decision Makers

The data collected regarding what factors were considered most important in their decision making in regards to implementing the district wide videoconferencing policy by the urban leaders in their respective schools is presented in Table 17.0. with the Bates (2000) ACTIONS model factors.

Table 17.0.
Decision Making (ACTIONS) Parameters for Urban Leaders (Bates, 2000)

Factor	Urban leaders	
	Frequency of occurrences	Occurrence ranking
Costs (relative/absolute)	51	1
Impact on learners	36	2
Access (by learners)	33	3
Organizational impact	29	4
Degree of interactivity	18	5
Speed	9	6
Novelty	3	7

Overall in this urban leader network, costs from the videoconferencing influenced decision making the most, while impact on learners and access to education are second and third in importance.

Cost

The factor that influenced the decision making of the urban decision makers the most was the *cost*. All the urban leaders stressed the point that the level of technology was not standardized across the district. Some schools had more technology than others. One urban leader commented:

We need to ensure consistency in the level of technology that schools have in implementing this policy. If a particular school does not have the appropriate technology to support this policy, then there needs to be a process in place where there is an opportunity for that school to apply for adequate funding (Pat Interview, p. 1).

Cost, including the *availability* of financial resources and the costs of setting up and maintaining the appropriate infrastructure were important factors considered by the urban decision makers. Cost here means including more than simply providing the videoconferencing equipment. It meant funding that could allow schools to create

videoconferencing rooms where on-site student support could be established for high school students. It meant that schools should have access to all the necessary resources to support differentiated learning. Urban leaders referenced things such as mentor teachers and student assistants for special need students as examples. The primary use of this system for their schools was using it to offer *enrichment courses* to students with learning needs.

For urban leaders, appropriate funding would allow schools to put in place basic human resource (positions) and organizational support services and could be extended to include funding the development of new courses geared towards the videoconferencing mode of course delivery. Urban leaders also felt that funding should address staffing. In its current delivery, teachers were required to teach students onsite as well as teach students from another school through the videoconferencing. This increased the workload for those teachers. They had to ensure that both students on site as well as those on the videoconferencing were equally engaged. Urban leaders reported this arrangement might have limited the amount of participation from urban schools. Principals were in fact sharing their teachers. A better scenario for them was to see shared staffing across schools. In its current model of delivery, urban leaders saw issues that needed to be addressed through providing the necessary resources.

Impact on Learners

Urban leaders spoke about the need to focus on students when making decisions, and in particular, when making any programming decisions. “As a principal, I believe it is important to keep in mind who the education is for and make decisions based on the needs of the students in my care” (Gavin Interview, p. 2). “My role is to ensure teachers

understand supports are in place to allow them to make good decisions and to deliver good instruction to students” (Tim Interview, p. 3).

At the center of improving student learning was the role of the teachers. Urban leaders focused on the commitment, consistency and quality of the teachers working with students. Pat added:

Quality and passion in the teaching staff is critical to providing classrooms focused on providing appropriate programming for students. It doesn't matter if that classroom is online or virtual. One of the major responsibilities of my administrative team is teacher evaluations. We require all our staff to submit year long professional learning goals. These goals must be aligned with our school development goals. Teachers who teach through the videoconferencing in my school are both experts in their specialty area and experienced with technology integration (Pat Interview, p. 4).

All the urban leaders discussed decision making in regards to providing professional activities to improve teaching and learning for the learner. They organized grade level meetings where teachers could share lessons, observe peers, develop lessons on higher order thinking, collaboratively refine instructional practices and provide feedback on practice. Aside from improvements to teaching and learning, teachers could more frequently use data for instruction, co-develop curricular assessments and focus on student work.

Having explored the factors that influenced the urban leaders in their decision making on implementation of this videoconferencing policy, the researcher next explores the content of that decision making.

Type and Content of the Urban Leader Decision Making (Brazer & Keller, 2006)

As with the rural leaders, the type and content of the decision making data is described and analyzed using Brazer & Keller (2006) Multiple Stakeholder Decision Making model under their four attributes: (1) content; (2) type; (3) role of the participants; and (4) type and structure of collaboration.

Content of Decision Making

This district wide videoconferencing policy was a mandatory policy implemented throughout the district. The decisions that were decentralized to schools were implementation decisions that impacted programming offered to their students. The data regarding what types of decision making was made by the urban leaders in regards to implementing the videoconferencing policy in their school as well as the process used to make that decision is presented in Table 18.0 with Brazer & Keller (2006) conceptual framework for educational decision making factors.

Table 18.0.
Content of Decision Made by Urban Leaders (Brazer & Keller, 2006)

Decision Making Element	Decision Making Process	Occurrence ranking
Strategic resourcing	Centralized decision making (mandatory district wide PD sessions for staff) as well as decentralized (principals in consultation with their department heads)	1
Planning, coordinating and evaluating instruction and the curriculum	Principals in consultation with department heads	2
Promoting and participating in learning and development	Centralized decision making (mandatory district wide PD sessions for staff) as well as decentralized (principals in consultation with their department heads)	3

Overall in this urban leaders’ network, the number one ranked type of decision making in regards to implementing the videoconferencing policy in their particular schools was in strategic resourcing, while planning, coordinating and evaluating instruction and the curriculum and promoting and participating in learning and development are second and third in importance.

Strategic Resourcing

In this study, three of the five (60%) of the participating urban leaders described managing school operations and allocating resources as their major decision making task. Urban leaders described how they spend most of their time and attention focusing on the knowledge, skills and attributes of teachers as they engage in teaching. Pat described the process as “managing the instructional program” (Pat Interview, p. 2). The demonstrated

leadership behaviors would be working with teachers, having professional dialogue around pedagogy and assessment, providing time and opportunities for teachers to reflect and collaborate in teams and providing for the professional development needs of teachers. All of these behaviors involved decision making that focused on building the capacity of teachers to work in teams.

An important decision for participating urban leaders was which staff to assign to teach using this system. For them, teachers not only needed to know how to operate the technology and their subject matter and curriculum, but they needed to know how to connect the two. For all of the urban leaders, this was a critical decision because the teacher needed to know how to utilize technology as a part of a wide array of instructional strategies in order to integrate technology with content matter in ways that are clear and meaningful to all students and their individualized learning needs. If their teachers did not have those skills, it was critical that their next important decision making task was to see how that type of training and professional development could be delivered to the appropriate staff.

These decision making leaders noted that they had to be instructional leaders who believe in building the capacity of teachers to work in teams. They felt strongly that it was their role to make important decisions regarding how to best provide the necessary training and embedded time in teacher's work week to collaborate. Tim noted: "In my school, teachers are given the opportunity to learn together, apply learning to the classroom and reflect on what is working and why." (Tim Interview, p. 3) Jill added, "The teachers in my school have an opportunity to improve continually as they meet each week with colleagues

who share their content and students” (Jill Interview, p. 4). It was important in their decision making to allow their staff to have available the necessary access to technology as well as the technical and instructional support. It meant providing a positive culture for professional collaboration.

Two of the participants in this case urban leaders described their school process as involving committees who developed common assessments, analyzed results and made plans for improving on results. These urban leaders held committees accountable by having them report to them on a regular basis on the outcomes of their collaboration. In one case, the urban leader met with each committee monthly throughout the year to review their work. If the committee was having difficulty in meeting the needs of some students, the principal had to make decision making in regards to determining the specific professional development or training needs required to address the problems.

Planning, Coordinating and Evaluating Instruction and the Curriculum

Urban leaders stressed that the autonomy for them, as it related to this district wide videoconferencing policy, was in the areas of curricular and instructional decision making. Specifically, in deciding the educational programming offered through the videoconferencing delivery mode as well as identifying the professional development needs of their staff in effectively implementing it. Jennifer commented:

As a principal with a large teaching staff, I have to decide not only which teacher qualifies but also who best fits in teaching the elective courses through the video conferencing system. I have to coordinate their training through district wide professional development with supplemental training at the school level to fill in any potential training gaps (Jennifer Interview, p. 5).

Urban leaders had bigger schools with larger staff so the focus of their decision making regarding this videoconferencing policy was that it allowed them to focus on the other dimensions of learning beyond the prescribed academic program. They used the videoconferencing mode of delivery for enrichment courses. *Unlike rural schools where the programming for the videoconferencing was the prescribed subject areas like math and science and was made mandatory for all students, urban principals made the decision to have only enrichment courses offered through videoconferencing. These courses were electives which meant that their students had a choice to take them or not.*

For those urban leaders, decision making involved how to manipulate the school schedule to free teachers for collaborative learning time. There was decision making around who would cover classes for teachers to free up time in their schedules to collaborate with peers working on assessment and developing classroom instructional strategies applicable to the videoconferencing setting. Collaboration time for teachers was provided through professional development days, staff meetings and release time through the use of free teachers covering classes or using substitute teachers to cover the classes. Structures or processes were created to assist teachers to focus on issues and questions that directly affected student learning. For these five urban principals, that process involved having department meetings and *committee structures*. Teachers required some training in order to implement these structures.

Promoting and Participating in Learning and Development

There were many cases during the implementation process for this videoconferencing policy where professional development was centrally planned and

delivered. In other instances, there were professional development days given to individual schools and the discretion of school principals to focus on the specific professional development needs of their particular school in implementing this policy. The urban leaders described a process of meeting with the department heads and making decisions regarding what specific department and/or individual teacher needs needed to be addressed in ensuring that they meet the strategies and goals of the school and district in regards to implementing this videoconferencing policy. Jordan commented:

The administration at my school developed a school based plan for this video conferencing system. We planned on what programming would be offered through it. Then we approached the specific department heads in our school and asked for their input into what teaching staff would be best suited to teach through this medium. From there, specific training needs were identified (Jordan Interview, p. 4).

Then further decision making occurred in dealing with the logistics of planning and delivering the specific professional development identified. This was all done in consultation and coordinated with district staff. Often district staff was involved in providing the specific professional development as identify by the administrative team. Examples highlighted included having computer support technicians train teachers on using specific aspects of the technology itself or for basic troubleshooting.

Types of Data used in Decision Making

The types of data used by the urban leaders during the implementation process and for what purposes are presented in Table 19.0.

Table 19.0.
Types of Decisions Made by Urban Leaders (Brazer & Keller, 2006)

Types of Data Used	Decision Making Element
Student learning data (i.e., assessments)	Strategic resourcing
Student learning data (i.e., assessments)	Planning, coordinating and evaluating instruction and the curriculum
Student learning data (i.e., assessments)	Promoting and participating in learning and development

Urban leaders described how they engaged in activities and professional dialogue to ensure the focus on improving student learning. They reported that it was very important that they be consistent in their decision making regarding integrating learning technology in their classrooms. In particular, they noted attention was paid to effective data analysis and focused professional development aligned with the goals of the policy. Urban leaders reported it was important that district administrators facilitate skill development by structuring the district to support professional development. The urban leaders discussed the importance of decision making in terms of providing appropriate professional development time and resources to support effective classroom implementation of the videoconferencing, often describing as in the citation below, how they worked with staff to understand the data in order to develop effective strategies to improve instruction. Jill commented:

The administration in my school meets monthly with the department heads to review the progress of programming occurring in the school. The team looks at how the students are meeting prescribed learning outcomes. If there are difficulties or challenges, we devise strategies to overcome them (Jill Interview, p. 5).

Urban leaders mentioned a culture of facilitation to improve skills. Jordan comments: It's in the tone of dialogue with staff as we analyze data to engage in planning and goal setting (Jordan Interview, p. 2).

Pat highlighted the view of all the urban leaders:

As professionals, our main role is to improve student learning. We are outcomes based. Whatever strategies or goals we identify as a school, they must work towards the district goal of maximizing student learning. Student achievement data is the driving force behind our school based decision making. It allows us to monitor our progress towards expected outcomes by asking questions such as, what is working? What should be improved? How should it be changed? For my school, our decision making is results driven (Pat Interview, p. 5).

The urban leaders highlighted that informal indicators such as student attitudes or how certain students were struggling was used to develop formal assessments.

Role of the Participants

The urban leaders reported that the whole administrative team at their school (principal, assistant principal, department heads) had a responsibility to *communicate* to all the stakeholders the district's and school's goals with this videoconferencing policy, what the district and school hoped to achieve with it and both the district and school's progress related to its use as a learning resource. The urban leaders reported it was a culture of focus on best practices; best practices focused on student learning. They saw their role as working on teams, setting goals and focusing on student improvement.

In this study, all five of the urban leaders highlighted the importance of appropriate decision making around professional development for school administrators. Jordan commented:

If teachers are teaching through videoconferencing, then e teaching has to a part of their performance appraisal. To do that effectively as a principal, I need to have acquired the appropriate knowledge skills to effectively be able to assess, monitor and provide feedback on their growth and development (Jordan Interview, p. 4).

Urban leaders reported that department heads played an important role in their schools. The department heads knew their own teaching staff so they were consulted on which staff to assign teaching through the video conferencing system. They also assisted with identifying the professional development needs of the school in getting those professionals trained in technical and pedagogy training. Tim commented:

The department heads know their teaching staff. It makes my job much easier to access their professional judgment in acquiring the personnel best suited to teach through the video conferencing system. It is a difficult teaching task that requires both content and technology knowledge (Tim Interview, p. 5).

Urban leaders reported that district administrators were important sources of information for them on seeking clarification on the policy itself as well as acquiring information on what district wide professional development sessions were being offered. The urban leaders also referenced district administrators being important in providing human resource help with any school wide network issues. Urban leaders understood that collaboration was an important part of implementing this district wide policy in their schools.

Structure and Types of Collaboration

All the urban leaders emphasized that they deal with decision making by involving *only those who's affected by the decision*. For decisions that allowed for consultation, they would consult with those who needed to be consulted. The consultation could include

parents, staff and students depending on who they thought should be involved in the decision making process.

In their particular school, it would be too time consuming, impractical and most likely unpleasant to involve all the staff in the decision making process as it pertained to this videoconferencing policy. Jill commented:

Teachers who are involved with teaching methods, classroom management and curriculum as it relates to offering programming through the videoconferencing are the ones consulted in the decision making process. It makes no sense to include the math teacher if they have no experience with the videoconferencing system” (Jill Interview, p. 3).

In their particular schools, *department meetings* and *committees* was the dominant structure used to involve the necessary people in the decision making process.

Urban leaders reported that it was important to have leadership teams at both the school and district level in terms of planning and reporting. At the school level, they viewed their role, department heads and assistant principals as a team who worked well together to share information from the district office and hold teachers accountable. Some felt it was important to shield the teachers from some of the impact of the bureaucracy, by minimizing data collection and interruptions to their teaching.

Urban leaders saw themselves and the central office staff as part of a team aligned in their purpose. They spoke about the central office staff as having focus and providing support and facilitation throughout the planning and reporting process and inviting input to district planning. According to them, goals were clear and professional conversations were encouraged. Those clear goals and conversations was what in fact guided their decision making.

All the urban leaders described how they had a very strong sense of team within the administration at their school. To them action was an important aspect of building capacity. Within a foundation of team and trust, urban principals took action to provide support and pressure. To provide support and pressure, urban leaders developed processes to engage with staff. They endorsed a *committee type structure* in having appropriate people involved in the decision making. Gavin commented: “Committee structure, when organized properly, allows us to achieve commitment. It motivates the staff and brings enthusiasm to the process” (Gavin Interview, p. 2).

Reflections on the Urban Leaders' Case Study

Table 20.0.
Summary of Urban Leader Case Findings

Conceptual framework	Urban leaders
Network analysis	
Structural features	The urban principal leaders decision making network can be described as a strong tightly closed associational network with many reciprocal ties. Density of 100%: There is effective information flow throughout the entire closed network.
Reason for establishing network ties	Urban principal leaders' reason for establishing their network tie was based on sharing same school type (high school principals).
Function served by network ties	<i>Acquisition of information and knowledge</i> was the most frequently cited function of their decision making network tie.
Bates (2000) ACTIONS Model Factors	
Factors which influenced their decision making with regards to implementing the district wide video conferencing policy.	The urban leaders were most concerned about the <i>absolute and relative costs</i> associated with the district wide video conferencing policy.
Brazer & Keller (2006) Multiple Stakeholder Decision Making Model Features	
Content of decision making	<i>Strategic resourcing</i> was the top ranked decision for urban principals.
Types of data used in decision making	They used <i>data driven decision making</i> based on <i>student learning data</i> .
Role of the participants	Urban principal leaders reported the important role of department heads, district administrators and principals.
Types of collaboration	Type 2 and type 4 decision making involving <i>committee structure</i> . They involved only those stakeholders affected by the decisions.

The urban leader network was found to be a strong closed associational network with many reciprocal ties. The density of the network was calculated at 100%. There is effective information flow throughout the entire closed network. The urban leaders' reason for establishing the network tie was based on sharing same school type (high school

principals). Acquisition of information and knowledge was the most frequently cited function of their decision making network tie.

The urban leaders were most concerned about the *absolute and relative costs* associated with the district wide video conferencing policy. The urban leaders also acknowledged that the decision to implement this district wide policy was made at the district level. They were limited to making school based curriculum and instructional decisions in terms of determining school based educational programming to be offered through the videoconferencing as well as professional development needs of their staff in implementing it in their schools. *Strategic resourcing* was the top ranked decision for urban leaders. They used data driven decision making based on student learning data. Urban leaders reported the important role of department heads, district administrators and principals in implementing this district wide policy. Type 2 and Type 4 collaborative decision making was used by urban leaders involving *committee* structure.

The District Leaders Decision Making Network

The District Leader Case

Each of the district leaders interviewed had a range of teaching and administrative experience. There were three males and two females. Their experience in teaching and district administration ranged from ten years to over thirty years. Most of their experience was with their current board, but a few district leaders spoke of experience with other boards in the province.

Background

To begin each interview the researcher asked each district leader to describe his or her district. The researcher wanted to know what was unique about their environment, particularly in terms of the rural settings and whether these setting impacted their decision making processes. The researcher asked how their district was similar or different from other districts and what made it unique.

Primarily, the district leaders described their school district as *geographically dispersed*. Several district leaders noted a declining student population in the district as a whole. The district covered a large geographic area with a variety of school configurations, including primary, middle, high schools; kindergarten to grade 12. It includes 65 schools located in 50 communities, with a student population of 12, 000 students. They acknowledge their school district has a distinctly rural population, with school sizes ranging from two students to over 900 students. The district leaders highlighted several challenges like diversity of programming, transportation and small schools. The district had some communities that were extremely remote. Eight schools are located in communities that are only accessible by ferries. None of the district leaders mentioned remoteness as an extremely negative factor, only a challenge.

District leaders acknowledged challenges, but focused on solutions and what was best for student learning. Rather than focusing on geographical issues when asked what was unique about their district, all district administrators spoke about the people and accomplishments of the district. They all reiterated their belief that their district was moving in a positive direction. Doug stated:

We pride our school district in being informed and pursuing different initiatives. The videoconferencing policy is a great example. As a district, we have a good grasp of assessment for learning and how to implement strategies. We want this school district to be innovative and be known as a leader (Doug interview, p. 2).

The District Leaders' Decision Making Network

The researcher used a number of network analytical techniques to describe district leaders' decision making network including its relations and structural properties. Figure 7.0 maps the patterns of relationships among top ranked leader nominees, describing the district leaders' decision making network structure. That is a map of who considered whom important in their decision making, presenting links as relations. It maps who actually mattered to whom on which relational ground.

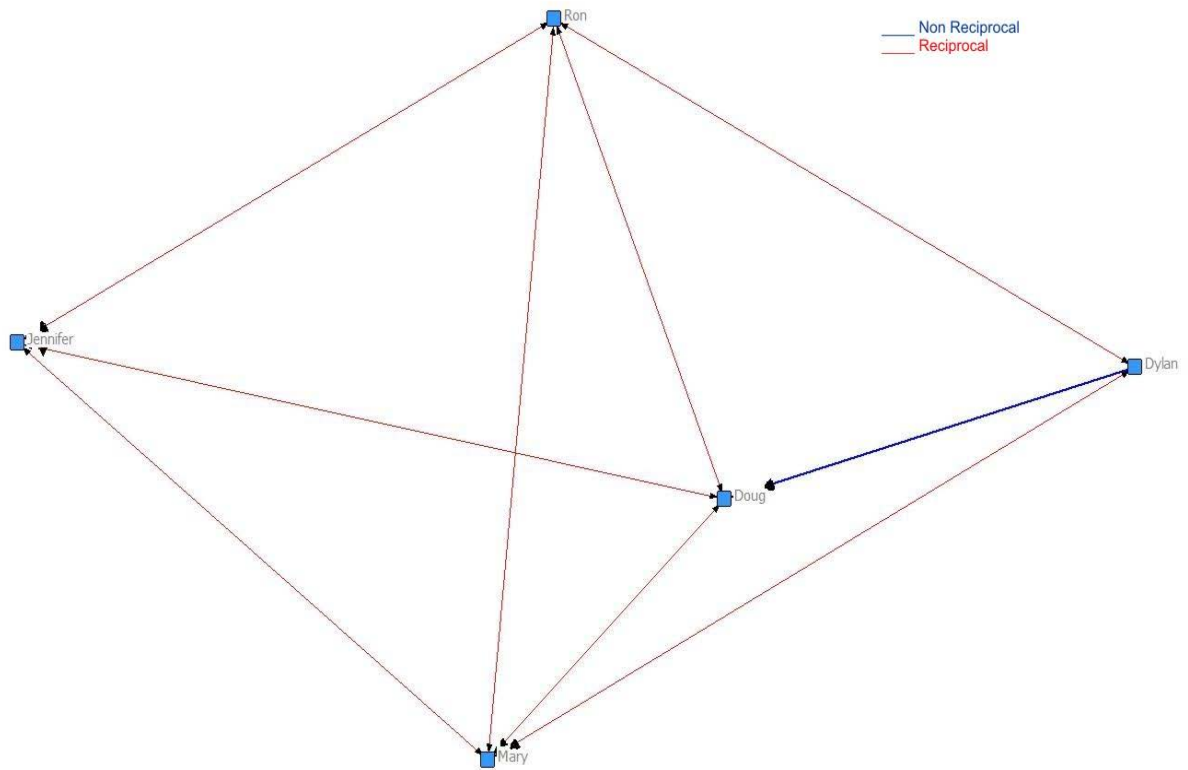


Figure 7.0. Network of district decision makers.

Network Relationships

In this section, the district leaders' network including relations and structural features such as density and connectivity are described.

Structural Features

Table 21.0.
District Leader Decision Making Network Structural Features

ID	Degree	Betweenness	Closeness
Dylan	3	0.0	3
Ron	4	0.3	4
Doug	4	0.3	4
Mary	4	0.3	4
Jennifer	3	0.0	3

Degree Centrality

The actors with the highest degree centrality in this network are Ron, Doug and Mary. In the decision making network above, Ron, Doug and Mary have the most direct connections in the network, making them all the most active nodes in the network. All three district leaders play an important role in the network. It is important to note where their connections lead to and how they connect otherwise unconnected. These three administrators connect Dylan and Jennifer. Ron was chosen based on the fact that he is the district administrator having the most contact with school principals. He informed them of the district's plan to implement the policy and provided their feedback back to district staff. He was seen as a valuable source of knowledge and information pertaining to implementation progress occurring at the school level. Jennifer was chosen based on her experience and training with Information and Communication Technologies (ICT). Doug

was a member of the senior administrative team responsible to report to the trustees. He was a hub between the district administrators and school board trustees.

Betweenness Centrality

In this decision making network, Ron, Doug and Mary have the highest betweenness. They have the best locations in the network. They play a “broker” role in this small, closed network. All three are connected to each other and bridge what would otherwise be isolates in Dylan and Jennifer. They each have direct connections to all other nodes. Since all three are connected to both Dylan and Jennifer, there is no single point of failure. If the tie between Dylan and Doug was broken, Dylan would still be connected through his ties with Ron and Mary. Likewise, that would be the case with Jennifer.

Closeness Centrality

In this decision making network, the person with the highest closeness are Ron, Doug and Mary, who are all senior district leaders. They all have been in the position the longest and are well informed of the issues within the district. They are all in an excellent position to monitor the information flow in the network from one another. Their pattern of direct ties allows these 3 of the 5 to access all the nodes in the network more quickly than anyone else.

The District Leader Decision Making Network Centralization

Individual network centralities provide insight into the individual’s location in the network. The relationship between the centralities of all nodes can reveal much about the overall network structure. A less centralized network has no single points of failure. It is resilient in the face of many attacks or random failures as many nodes or links can fail

while allowing the remaining nodes to still reach each other over other network paths. This network is found to be less centralized network in that it is not dominated by one or a few very central nodes. If the tie between Doug and Jennifer was damaged, Jennifer could stay connected through her ties with Ron and Mary so the small, tight network seems resilient.

Density

A description of the flexibility and ease of information exchange in a network depended on the network density and connectivity (Krackhardt as cited in Ibarra, 1992, p. 216). The density of a network is simply the proportion of all possible ties that are actually present. Density is defined as the sum of the ties divided by the number of possible ties (i.e. the ratio of all tie strength that is actually present to the number of possible ties). In this district leader network, Ron (4), Mary (4), and Dylan (4) have the highest indegree, indicating that these were the actors with the “know-how” in the decision making regarding the policy implementation. This gives them more informal organizational influence within the network. The interview data supported this analysis. The density for this particular network was calculated as 0.850 which means that 85% of all the possible ties are present. This highly dense network structure provided a description of the district leaders’ network as a relatively flexible network experiencing little difficulty exchanging information.

The Nature of the District Leaders Decision Making Network

Table 22.0.
Functions served by District Leaders' Decision Making Network

Function	Occurrence ranking
Acquisition of information and knowledge	1
Advancement on career	2
Affiliation or sense of belonging	
Appraisal or evaluative feedback	
Friendship	
Arousal or transfer of energy	

In terms of the kind of support that was provided to the participants through their relationships with their fellow district leader (see Table 22.0.), the *function of acquisition of information and knowledge* was given the highest rating in terms of importance by four out of five district administrators. Participants turned to each other for assistance for questions with policy issues, troubleshooting, and evaluation issues. One participant summed up their relationship with a colleague as “we really work as a team in developing all our divisional policies and then ensuring that all the important and necessary information is dispersed to the appropriate staff (both at the district and school level)” (Ron Interview, p. 2). Mary adds:

It takes a lot of work and cooperation to ensure that all our district peers are familiar with the policy. Then we work as a team on developing a process to assist its users on implementing the policy throughout their school (Mary Interview, p. 3).

One district leader rated *advancement in career* as an important function of their relations. This particular district leader referenced how he was hoping to receive a more senior position within the district. He often sought out committee work to get known by

upper district management staff so that he might get consideration in management positions.

The most common function concerns the perceived “knowledge” and “experience” of the district leader. The prevalence of knowledge-based functions is encouraging from an organizational learning perspective because district leaders, like principal decision makers are basing their selection of ties upon what they perceive as the peer with the most useful know-how in implementing the videoconferencing policy. In terms of types of relationships, it appears to be predominantly knowledge exchange relations between the district administrators.

District Leader Choices for Establishing their Network Ties

The researcher began by examining what characteristics are associated with each district leader’s overall popularity in the network—also called his or her centrality within the network (i.e., in-degree). The actors with the highest indegree are Ron, Mary and Doug. *Committee work* was the main topic discussed among these district leaders. The district leaders were chosen to be on the videoconferencing policy committee based on their *degree of specialization and purpose*. It was *hierarchical* in that participants were asked by their superior to serve on the committee based on their area of specialization and their specific role within the district. The results suggest that in general area of specialization play the overall strongest role in determining whom the district leaders choose as influential in their decision making network.

All the district leaders were asked what influenced their selection of the referent as their primary decision making contact and the dominant response was based on the fact that

they shared the file with that particular individual. They were assigned a specific responsibility in the policy implementation process. Interestingly, there was no mention of friendship or trust in their interviews. They all choose each other based on the fact that they were district leaders assigned a specific role within the drafting and implementation process of this district wide policy (see Table 23.0.).

Table 23.0.
Reasons Given by District Leaders for Establishing their Network Ties

Reason	Text example(s)	Occurrence ranking
Area of specialization and purpose	“Technology experience”; “district role”	1
Knowledge/experience	“Knowledgeable”; “experienced”	2
Friendship/trust	“Trustworthy”; “honest”; “someone to talk to”	
Prior tie	“Have known”; “worked with them professionally for a number of years”	
Leadership	“Leader”; “leadership skills”	
Same school type	“Similar school”	
Advancement on career	“Promotion”; “connection to others”; “opportunity to pursue other opportunities within the district”	

In the next section, how the district leaders described their decision making practices is explored.

Decision Making Process Factors (Bates, 2000): District Leaders

The district leaders described their decision making process in regards to this videoconferencing policy as a *systemic process*. A district committee structure started the process by setting the policy frameworks and guidelines prior to implementation in schools.

The district leaders reported that it was their desire as a board to have policies in draft form and allow a timeline for feedback before adopting it as their official policy. Once the policies were field tested and feedback compiled, then all the desired amendments would take place and the policy would be ratified as an official policy of the school district. Doug commented:

It is important to follow the entire process throughout. This way all stakeholders can assess if the policy is realistic, and more importantly to suggest any changes that might make it a better policy applicable to all schools. There must be educational relevancy: we need to assess if the policy is supportive of the educational direction of the district (Doug Interview, p. 2).

Mary added:

A particular policy must be effective not just on paper, but in practice. This occurs only if appropriate supports are put in place to support it. It means that we have to make policy guidelines broad enough to accommodate local situations, but at the same time allow for consistency within the district (Mary Interview, p. 3).

Ron quoted Michael Fullan with “problems can become our friends.” He stressed the point that as a school district they had to make the appropriate decision making to ensure this policy was implemental by all schools. This involved making decisions regarding appropriate professional development to the various stakeholders involved in its implementation.

Doug commented, “It takes time to implement a policy. It is important to build a period of time for the implementation phase.” He adds that it is also important to evaluate at the developmental stage:

It starts by making decisions around questions such as do we have the mandate to enforce this policy? Do we have the mandate to implement such a policy (it must be consistent with the goals of the school board (i.e., support student learning)? Do we

have the resources to fully implement the policy throughout the entire district?”
 (Doug Interview, p. 3)

Mary added, “There must be evaluation from the development perspective. We have to look at results. There have to be demonstrated changes in student learning” (Mary Interview, p. 2). The district leaders reported that their decision making involved building a process for implementation in schools, making contact with schools, providing a forum for discussion, providing a means of feedback (like surveys, natural observations), general observations at the school, feedback from the teams (administrators, students, school councils, etc.). After providing the initial training and infrastructure, schools were responsible to determine how best to use this system to deliver programming and professional development in their schools.

Factors Influencing District Leader Decision Makers

The data collected regarding what factors were considered most important in their decision making in regards to implementing the district wide videoconferencing policy by the district administrators is presented in Table 24.0 with the Bates (2000) ACTIONS model factors.

Table 24.0.
 Decision Making (ACTIONS) Parameters for District Leaders (Bates, 2000)

Factor	District leaders	
	Frequency of occurrences	Occurrence ranking
Organizational impact	56	1
Costs (relative/absolute)	47	2
Impact on teachers/learners	36	3
Access (by learners)	35	4
Degree of interactivity	15	5
Speed	7	6
Novelty	5	7

Overall in this district leader network, organizational impact from the videoconferencing influenced decision making the most, while costs and impact on teachers and learners are second and third in importance.

Organizational Impact

The district decision makers considered the *impact on the organization* as the most important factor influencing their decision making. They reported it was important to consider the potential impact of changes to the distance learning system and how this would affect the district as a learning organization. All district leaders expressed the importance of having a clear vision with this policy, knowing where the policy is going, what it stands for, and what they are working towards. They indicated it must be viewed not as a district vision but a shared vision. If school administrators, teachers, students and parents are excluded, the district has lost the opportunity for all the stakeholders to develop shared understanding. The district leaders commented that they were a part of a larger organization which involved working with and through other people to reach the goals of the organization. Therefore, organizational decision making in which stakeholders are involved, is necessary to maintain an organizational culture founded on a shared vision for the organization. Equally important to them was ensuring that organizational decision making was based on sound data.

100% of the participating district leaders agreed it is essential to have a clear vision when implementing a district wide policy. It is important to know what it is that they are all working to create. The district leaders highlighted that a goal of their district was that all employees contribute to the improvement of organizational effectiveness through

continuous learning, creativity and the implementation of best practices. To them this highlighted what this videoconferencing policy was all about. Organizational learning and effectiveness involved professional development, technology and communication. Doug commented:

As a district, our mission statement is to enhance student learning by enhancing supports and services available to our students. In that process, we need to be creative and innovative and doing what we can as a learning organization to meet the diversity of needs of all our students. This video conferencing policy was intended to allow principals the opportunity to have an alternative means of delivering learning outcomes to students as well as enhance the professional learning opportunities for their staff (Doug Interview, p. 4).

Costs

The second most important factor that influenced the district leaders in regards to this district wide videoconferencing policy was *cost*. The district leaders highlighted that they had a mandate to ensure that all district policies had identified goals and strategies focused on the wise use of resources. In terms of this district wide videoconferencing policy, the district leaders highlighted that there must be a commitment to providing adequate resources, technologies and professional development. To successfully implement this policy in all schools required investing in the infrastructure to ensure quality programming and create optimal learning environments. This meant that they had to enhance school infrastructure for instructional program benefits. Doug commented:

This process will look differently for individual schools. For some, it will mean only minor changes. For other schools and communities, it will require a major investment of time and money. It all needs to be done under a framework of improving student learning (Doug Interview, p. 3).

Impact on Learners

The third ranked most important factor that influenced the district administrators' decision making was looking at its *impact on learners*. Providing an equitable education was cited as a challenge for the Nova Central School Board with 12 000 students spread through 65 schools of various configurations in a large geographical area. The motto, "where students come first" was described as an important gauge in their decision making process (Ron Interview, p. 2).

All the district leaders referenced the goal of the district and how all their programming and decision making was focused on maximizing student learning. The goal of this policy was to develop a network of interactive video conferencing amongst all the schools and with the district office. It was intended to expand current training and professional development options as well as offer extra programming options to schools. These initiatives specifically aimed to increase student achievement. All the learners-students receiving programming, teachers teaching with it and staff receiving professional development needed to feel comfortable using this mode of delivery. Mary commented:

In order for this policy to be successful, there must be buy in from its users. The district has to consider the impact of this technology on all the learners using it. Ultimately, its progress will be measured on how well it is being utilized in the schools with desirable results (Mary Interview, p. 3).

Having explored the factors that influenced the district leaders in their decision making on implementation of this videoconferencing policy, the researcher next explores the content of that decision making.

Type and Content of the District Leaders Decision Making (Brazer & Keller, 2006)

As with the rural and urban leaders, the type and content of the decision making data is described and analyzed using Brazer & Keller (2006) Multiple Stakeholder Decision Making model under their four attributes: (1) content; (2) type; (3) role of the participants; and (4) types and structure of collaboration.

Content of Decision Making

The data regarding content of decision making made by the district leaders in regards to implementing the videoconferencing policy as well as the process used to make that decision is presented in Table 25.0 with Brazer & Keller (2006) conceptual framework for educational decision making factors.

Table 25.0.
Content of Decisions made by District Leaders (Brazer & Keller, 2006)

Decision Making Element	Decision Making Process	Occurrence ranking
Decentralized and centralized decision making	District leaders	1
Strategic resourcing	District leaders	2
Promoting and participating in learning and development	Centralized decision making (mandatory district wide PD sessions for staff) as well as decentralized (discretion of the school administrative team)	3

Overall in this district leader network, the number one ranked type of decision making in regards to implementing the videoconferencing policy was in decentralized and centralized decision making, while strategic resourcing and promoting and participating in learning and development are second and third in importance.

Centralized/Decentralized Decision Making

District leaders noted over the past several years that their elected school boards had been working to find the appropriate balance between centralized and decentralized decision making. They believed it was important for schools to participate in decision making to ensure ownership, but to be efficient some programs and services were better administrated centrally. The district leaders felt strongly that they promoted decentralized decision making to school principals regarding this videoconferencing policy by allowing them to make their own decision making around what specific programming their school would offer through the videoconferencing system. They also allowed principals to make decisions regarding professional development choices based on the individual needs of their schools and their teachers. Doug commented: “Some principals may want to have small group meetings during the school day, while others may need release time through the use of building substitutes. We incorporate both a district and school based approach to providing professional development” (Doug Interview, p. 2).

The district had a *committee structure* in place to develop and discuss issues such as policy drafting and implementation. As district leaders, they made centralized decisions with this videoconferencing policy in regards to developing the policy guidelines and frameworks and dealing with such things as district wide professional development, resources and supports.

Mary commented that as a district one of their first major decisions involved consideration of top-down versus bottom up perspective on policy implementation. She commented,

Policy implementation gaps can occur if policy is imposed from the top with no thought given to how it might be perceived or received at the local level. It is simply not a case of bottom up approaches to policy implementation and action being preferable to top down. For us as a district, the right balance between the two is necessary. A part of that process involved allowing school principals the ability to make local decisions regarding distributing resources and providing professional development that was school-based (Mary Interview, p. 4).

Strategic Resourcing

The district leaders reported decision making in the area of strategic acquisition and wise use of resources to achieve their policy goals. The implementation process throughout the school district needed to consider how best to implement this policy and what support structures needed to be created. Doug commented: “As a district, we must have personnel who are familiar with the policy that is adopted by the schools and who understands the policy requirements and its role in the individual school’s overall instructional program” (Doug Interview, p. 3).

Senior participants ensured that the time needed for the policy did not conflict with district rules and regulations, parent and teacher expectations as well as collective bargaining agreements.

The district leaders were found to believe that it was necessary to provide principals with adequate professional development, time to reflect upon the changes required for policy implementation to occur at the school level and time to engage in collegial relationships with their peers. District leaders highlighted having to make decisions around budgeting to hire substitutes for teacher release time. The district leaders reported having to make decisions regarding provisions to provide the time for teachers and principals to spend on the policy. A part of this decision making process was allowing

schools some discretion to plan its own professional development and provide input into how the money the district allocated for staff training was going to be spent locally in their respective schools.

Promoting and Participating in Learning and Development

District leaders viewed professional development as opportunities for teachers and principals to collaborate. District leaders provided district time along with discretionary time for professional development. There was decision making around how much time would be devoted to each of these. Dylan commented: “Teachers and administrators need the skills to be able to use it effectively in their schools” (Dylan Interview, p. 4). The district leaders had to make decision making in regards to how to coordinate efforts for professional development between individual schools and district wide to help the schools reach the goals of the policy. This involved individual schools planning their own staff development as well as mandatory district wide professional development sessions.

Types of Data used in Decision Making

The types of data used by the district administrators and for what purposes are presented in Table 26.0.

Table 26.0.
Types of Data used by District Leader (Brazer & Keller, 2006)

Types of Data Used	Decision Making Element
Student learning data (i.e., assessments)	Centralized/decentralized decision making
Student learning data (i.e., assessments) and school process data	Strategic resourcing
Student learning data (i.e., assessments)	Promoting and participating in learning and development

In this study all the district leaders reported the use of data to drive the implementation process and make informed decisions. All participant district leaders described spending time analyzing data at both the school and district level. Their reviews included efforts to disaggregate the data to understand the results which they did find helpful in improving student learning. Three of the five district leaders highlighted being involved in analysis of locally developed data from teacher tests and individual student programs. They emphasized that they were not looking to make excuses for results or lay blame, but to *discern patterns and trends in order to design effective strategies to address areas of concerns*. Ron commented: “In my role, it is important to understand the external influences and to work with the principals to ensure they don’t lose sight of the vision” (Ron Interview, p. 2). Doug noted sometimes principals focused on the management issues and did not like to be reminded of the focus on the bigger vision and were frustrated, but his job was to get them back on track. He reported that principals must focus on evidence of learning and concentrate on how to use evidence of learning to strengthen professional practice. Dylan commented: “It is important that district administrators provide documentation and processes that provide structure within which principals had latitude to make local decisions” (Dylan Interview, p. 3). The need for processes also extended to the role they played with their administrative team at the district office. Mary explained:

It’s really about availability and having formal and informal conversations. With the administrative team at the district office, we meet a lot as a team and individually so that the team members can think out loud. Those kinds of things occur with the principals during our principal leadership meetings (Mary Interview, p. 3).

Doug described his hope that principals gain a better understanding of data analysis. Rather than looking at data in a competitive manner, principals could use the results to spark conversations. In describing how data should be used, Doug stated:

Competition is good. It can motivate people. It could also be an indicator system which should cause principals to ask the question why and what we need to do as a school to make this work. It means working hard to track it down and pin pointing where some of the issues might be and then strategizing to address them. It about asking, what do we need to address? (Doug Interview, p. 4)

District leaders reported witnessing more principals paying attention to how data can be used effectively. School principals were asking for district data to be turned around faster for use in school planning. Although the district leaders reported some principals were beginning to understand the importance of reliable data and were getting better at analysis, they were concerned about the ability of all principals to understand and use data effectively. The concern was expressed by one (anonymized) participant in this study that school principals may feel ill-prepared to do the necessary analysis and are overwhelmed with the day to day work with little time for strategic planning. District leaders wondered about the variation in ability to use data effectively. Mary expressed concern regarding the ability of principals to use data effectively: “Between the training and gaps in leadership, we’ve got some real weaknesses in terms of how to use data and information to really inform us about what is happening” (Mary Interview, p. 3). District leaders reported their role in ensuring that principals know how to analyze and interpret data, write measurable goals, set achievable targets and develop appropriate strategies to meet the goals. Principals need to master skills associated with productive planning and the implementation of such plans. All the district administrators reported that training to acquire these skills must be

given to the principals. They reported that principals must focus on evidence of learning and concentrate on how to use evidence of learning to strengthen professional practice in their schools.

District leaders were concerned some misconceptions about data may be hampering the effective use of the data in decision making. People who have professional training tend to rely on professional judgment inappropriately, rather than looking at what the data is telling them, as Dylan cautioned:

There is a tendency for principals, especially if they have been in the field for awhile, to rely more heavily upon judgment. It is important to show them that the use of data as well as the seasoned judgment is required (Dylan Interview, p. 4).

In this study, district leaders reported that data driven decision making gave school and the district the power to manage learning results. They stressed that managing the learning result was a *systemic process* involving the whole school, principals, teachers and students. They described the data driven decision making process in regards to this videoconferencing policy as looking something like this: first, the district would determine a set of performance goals based on academic standards and benchmarks. Next, the district would create processes for assigning resources to evaluate the link between instructional and operational inputs and student performance. The schools and district then collect data ensuring that it is relevant and accessible. Next, the data is analyzed to develop planning about appropriate interventions. Important to this process for the district leaders was getting timely feedback and cooperation from the school principals.

Role of the Participants

The district leaders highlighted the fact that principals played a critical role in the policy implementation phase. Sergiovanni (1991) agreed that “principals are the main characters in bringing about adoption and implementation of district goals and policy at the school level” (p. 263). The district leaders stressed the importance of having each school principal review the district mission along with the policy with their staff. “I am a strong believer that we need to have everyone clear on what the vision of the district is and reflect on the policies that support that mission” (Doug Interview, p. 3). District leaders point out that principals convey expectations for policy implementation to their staff. If the messages conveyed by principals are not always congruent with the district aims it may influence how staff implements the policy in their classrooms. The principals also have direct supervisory authority over key staff members who play important roles in the implementation process occurring in their schools.

The method used for this review varied (some schools developed committees; other schools dealt with the review at their monthly staff meetings; some schools involved their school councils; other schools gave the district mission and policy document to all staff members to review on their own and then reconvened as a group to discuss the issues) but the essence of starting the policy implementation knowing what the mission was and what they are working towards was essential in all district staffs’ views. One district leader commented, “What is the sense of having a policy if no one knows what they are working to create” (Ron Interview, p. 2). The values and beliefs underlying the policy must be in concert with the values and beliefs of the community it serves. It is important to have a

shared vision for the videoconferencing technology and the district policy should reflect that. The district learners reported it was important that principals share the policy with students at school assemblies, with staff at staff meetings, and with parents at school council meetings. “We need to consider the feedback from all the stakeholders as tools to identifying barriers and then design strategies for their improvement” (Mary Interview, p. 3).

District leaders highlighted that principals have a strong influence on the diffusion of the policy in relation to other school staff. The principals were the ones that primarily disseminated information regarding the policy to the teachers who were the ones doing the “on the ground” work making the policy implementation happen in the classrooms (Doug Interview, p. 3). Although all principals received a similar message from the district administrators, the way the principals approached delivering the policy to their school staff varied. District leaders referenced how some principals used a technical information sharing approach. The principals focused on the nuts and bolts aspects of the videoconferencing system. In contrast, other principals used a collective learning approach. The principals outlined the broad scope of the policy, its aims and potential outcomes for their school. The principals were perceived by the district administrators as providing both information and guidance around the policy while respecting their staffs’ ability to implement the policy. For the district leaders, principals were described as having differing levels of skills, knowledge and understanding of the policy, which appeared to impact their ability to diffuse information to their staff. This resulted in schools, even though they were part of a district wide process, to begin the implementation process at vastly different points

based on the introduction by principals. This impacted the school staff's ability to implement the policy and perhaps ultimately affected the lack of consistency in implementing the policy district-wide.

District leaders reported principals also had an important role to play in keeping parents and community members informed. When parents, staff or the community express concerns about any technology-related aspects of schooling, principals are the front line leaders they communicate with. In fact, principals' advocacy efforts are important for reminding others of why learning technologies are important. One way district leaders commented principals were doing that was through frequently and visibly highlighting the amazing work that their students and staff were doing using the particular piece of technology.

The participants in this case reported that it was important to have a *monitoring* process in place throughout the year. Important to the district leader was allowing principals the opportunity to share their progress with district staff. Principals would report to the district the progress of the implementation of the policy occurring in their school and highlight any strategies that needed to be reevaluated. This was believed to give the school district the opportunity to use a collaborative approach to provide guidance, share best practices, and provide feedback on a continual basis. Mary commented:

Principals need skills associated with productive planning and the implementation of the policy in their school. Training to acquire these skills must be given to the school principals. Given the critical role of principals in determining how resources such as on-site professional development are used and given the degree to which they influence the level of congruence at the school site, it was very important to bring principals squarely into plans for policy implementation" (Mary Interview, p. 3).

District leaders acknowledged the important role of teachers as they were delivering the instruction in the classroom as well as receiving professional development through this videoconferencing system. It was important to get their feedback on things that are working well as well as areas where there are concerns. Doug added:

As a district, we need to have a policy implementation process in place. This involves district administrators working with school administrators and their staffs to set measurable goal setting related to the vision of the policy. It means that we develop strategies to meet the policy goals. This process involves district staff, principals, school councils, staff and students continuing to monitor the progress and identifying the areas that are working well as well as those areas that we need to continue to work on or improve (Doug Interview, p. 4).

District leaders saw their role as important in providing support to schools in terms of providing the necessary resources such as infrastructure, human resource and professional development as well as providing clarity and direction with the videoconferencing policy itself. At the district level, the district leaders put in place documents such as the policy guidelines and timelines, both in hardcopy and available through the district website and processes to encourage dialogue. These documents were intended to provide a framework for decision making, but were not perceived by the district administrators to restrict the local decision making planning of the principals.

District leaders viewed their role as keeper of the vision and facilitator of process and structure to guide strategic planning for the videoconferencing policy. They worked with both the elected school board and principals to scan the environment, monitor progress and encourage action. Doug commented:

It is important that we work with both the schools and trustees to ensure that we all collectively monitor the progress of our programming. This involves getting

feedback from the field to see where progress is made as well as looking at areas where we might be falling short on target goals. The ultimate goal of this policy is to increase student achievement, so we need to ensure we all stay focus on that important goal (Doug Interview, p. 5).

District leaders reported their role was to work with the board and principals to ensure they didn't lose sight of the district vision. District leaders noted sometimes principals focused on the managerial issues and did not like to be reminded of the focus on the bigger vision and were frustrated, but their job was to get them back on track. Most of the district leaders described how they structured feedback loops to ensure they were aware of issues with stakeholders, particularly the elected school board members and principals.

District leaders reported that an important part to the implementation process for them was having established collaborative structures where leadership could be shared.

Structure and Types of Collaboration

In this study, district decision makers reported that it was important to have a close working relationship with principals and technology coordinators. Network analysis shows that they have a close working relationship with each other and with some principals. Working together as part of a team, they could help ensure that the videoconferencing implementation could be carried out in a thoughtful manner that meshed school and district visions and goals for the technology. The district leaders reported strongly that this team-based approach would help ensure consistency in implementation in cases where there was district or school based administrator turn over.

Several district leaders spoke of how they worked with principals in a supportive manner, instead of enforcing procedures when implementing the videoconferencing policy.

Ron described how he saw the difference between a manager and a leader in implementing the videoconferencing policy: He stated:

There is a huge difference between being a leader and a manager. As I look at implementing the videoconferencing policy, a manager uses direction and enforcement of policy and procedures to accomplish specific tasks. A leader encourages and gives regular feedback. A leader influences and inspires others and encourages the team to follow a vision. It involves delegating and empowering people. That is what I try to do (Ron Interview, p. 3).

Dylan discussed how respect between the district leaders and principals was critical in influencing policy implementation. He commented: Our relationship with principals is absolutely critical in determining whether a particular policy will be accepted by a particular community because our interaction with the school community often is through the medium of the principal” (Dylan Interview, p. 2). District leaders discussed the importance of principals using a collaborative process to obtain feedback from all the stakeholders involved in the policy implementation process occurring within their respective schools and communities. This feedback along with the principals’ experience in dealing with the policy at their specific school level was what provided direction to their decision making with this policy.

District leaders were aware of the need to proceed with care when dealing with change. The right combination of support and pressure was critical. Jennifer emphasized the importance of consultation in the process.

I think we, in our district, are very careful to implement policy and programs with lots of consultation. I think there is a high level of trust that when we bring things forward to them, there will have a chance for input (Jennifer Interview, p. 2).

Doug identified the need to move carefully, particularly in areas involving change. He stated:

For many veteran administrators, I believe there may be a fear of change and a fear of having to do things differently. Sometimes it is a fear of what is perceived to be working harder. I personally think it is more about exploring all the available opportunities to enhance student learning (Doug Interview, p. 3).

Although Ron acknowledged it was important for district leaders to act as change agents, the journey could be difficult. Ron identified another aspect of trust as the need for frequent *communication* during the change process, followed by *capacity building through professional development*. He concluded, “The key to successful implementation of the videoconferencing policy has been the communication and the training” (Ron Interview, p. 2). District leaders acknowledged that the presence of central office staff in schools was critical to building relationships. They described how they assured school principals that support was available and instituted practices such as appointing central office liaisons in the way of senior education officers to individual schools. They also arranged procedures to address emergent issues in a timely manner. They was in the case of a communication protocol which outlined the steps and individual whom to contact.

The sub-theme of capacity building through collaboration emerged from the district leaders’ interview data.

Capacity Building through Collaboration

District leaders observed they shouldn’t assume all individuals had the requisite skills and knowledge required for the implementation of this policy. The need to ensure support was available for building capacity. Ron described how he worked to develop

supportive relationships with principals, by offering support even to the seasoned principals. Ron stated:

You cannot make the assumption that people know. I would rather you made the assumption they don't know. District staff must get out in the schools and have discussions with all the school staff involved in implementing this policy to best determine what specific needs needed to be addressed. This then has to be the catalyst for making decisions around planning the professional development at both the district and school level (Ron Interview, p. 2).

District leaders understood the development of trusting relationships was a journey that they could influence through providing support. It meant that district leaders had to be available to the schools. They engaged in personal dialogue or set up processes to promote professional development. *Professional learning communities* at the district and school level were recognized as important structures to support the building of capacity. District leaders met with fellow central office staff and school principals to engage in dialogue and questioning regarding the policy implementation. Increasing the capacity of school principals was viewed as a critical aspect of building capacity in the school district. It was important that they had the courage to make hard decisions. Doug provided examples of teachers and principals taking the lead in providing professional development for others.

Building capacity in the teaching force was of importance to district leaders.

Teachers were the ones delivering instruction as well as receiving professional development through this videoconferencing equipment. Doug acknowledged that providing strong mentoring and supervision in small rural schools was not without its challenges. He explained:

It is difficult in a small rural school with only one staff to provide a mentor. It's difficult to do, but it is important to bring people together and create a network. This

videoconferencing system has that ability to create such a supportive network (Doug Interview, p. 3).

Dylan captured the sentiment of district leaders as to how human capacity grew in a risk-taking environment and maintaining a focus on the vision. He stated:

I think we have a large amount of human capacity built upon an environment that encourages risk-taking and when people come together it's more about maintaining a focus on the vision (Dylan Interview, p. 4).

Reflections on the District Leaders Case Study

Table 27.0.
Summary of District Leaders Case Findings

Conceptual framework	District leaders
Network analysis	
Structural features	Highly dense closed network structure with many reciprocal ties. Density of 85% meaning there is effective information flow throughout the entire closed network.
Reason for establishing network ties	District leaders' choice was based on area of specialization and purpose.
Function served by network ties	Acquisition of information and knowledge was the most frequently cited function of their decision making network tie.
Bates (2000) ACTIONS Model Factors	
Factors which influenced their decision making with regards to implementing the district wide video conferencing policy.	The district leaders were most concerned with the <i>organizational impact</i> associated with the district wide video conferencing policy.
Brazer & Keller (2006) Multiple Stakeholder Decision Making Model Features	
Content of decision making	<i>Centralized and decentralized</i> decision making was the top ranked decision for district leaders.
Types of data used in decision making	They used data driven decision making based on student learning and school process data.
Role of the participants	District leaders reported the important role of teachers, district administrators and principals in implementing this district wide policy.
Structure and types of collaboration	Type 1, Type 2 and Type 4 collaborative decision making was used by district leaders involving <i>committee</i> structure.

The district leader network was found to be a highly dense closed network structure with many reciprocal ties. The density of the network was calculated at 85%. There is effective information flow throughout the small closed network. The district leaders' reason

for establishing the network tie was based on area of specialization and purpose.

Acquisition of information and knowledge was the most frequently cited function of their decision making network tie.

The district leaders were most concerned about the *organizational impact* associated with the district wide video conferencing policy. *Centralized and decentralized* decision making was the top ranked decision for district leaders. They used data driven decision making based on student learning and school process data. District leaders reported the important role of teachers, district administrators and principals in implementing this district wide policy. Type 1, Type 2 and Type 4 collaborative decision making was used by district leaders involving *committee* structure.

District-Wide Decision Making Network

Research suggests that the careful exploration and analysis of the network of the relations of key decision makers in an organization may be an important first step in understanding the success of change efforts, as well as identifying the potential problems in its adoption or implementation (Tenkasi & Chesmore, 2013). With this particular policy, the key decision makers were the district administrators and the school principals, so this researcher felt that the connections between those key decision makers needed to be mapped in order to provide a clearer picture of the overall district's network.

Network Relationships

This is a map of the organization created by decision makers who identified each other as important colleagues in making the decisions to implement the district wide video conferencing policy implementation decisions, and this graph (Figure 8.0) shows rural,

urban and district relationships at once. What follows is an analysis of this decision making organization from a relational (network) perspective.

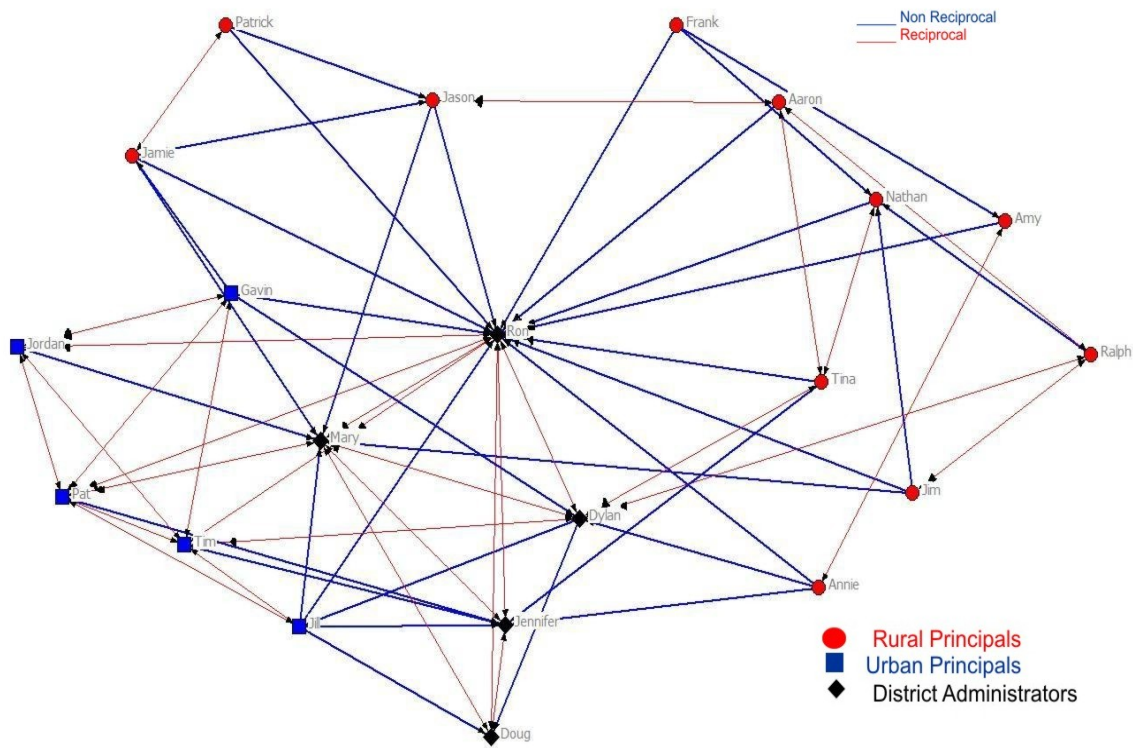


Figure 8.0. Network of principals and district administrators mapped together.

Relations

The district network (figure 8.0.) describes the actor relationships in this Nova Central School District network. Arrowheads indicate the direction of the nomination to the network. It is interesting to note that so many references are “one way” nominations in this network. This indicates that the actors in this network, overall, do not consider each other mutually influential in the decision making process. An overall description of this relation pattern was that a high degree of interdependence existed between some actors, particularly the district staff, and strong reciprocal associations existed between the urban principals. Slightly weaker relations (mutuality) existed between district staff and the school based principals. All actors were asked to define the strength of their nominee ties on a scale of one to ten, and all the actors responded by assigning “strength” values between six and ten. This was true for actors in all cases, indicating that no one wanted to identify a weak link, so that particular descriptive interview data was not used to describe relation strength.

There are 21 actors here and all of them are “connected.” But, clearly not every possible connection is present, and there are thin spots in the network. There appears to be some differences among the actors in how connected they are (compare Ron and Jennifer to Amy and Frank). If we look closely, we can see that some actor’s connections are likely to be reciprocated (that is, Aaron shares information with Tina and Tina also shares information with Aaron); some other actors (Jamie and Amy are more likely to be senders than receivers of information). As a result of the variation in how connected individuals are, and whether the ties are reciprocated, some actors may be at quite some “distance” from other actors. There appears to be groups of actors who differ in this regard (Ron, Dylan and Jennifer seem to be in the center of the action while Frank, Nathan and Jamie seem to be more peripheral). There were 32 reciprocal referrals, meaning referrals where 2

interview candidates had referred each other. The most frequently referred person was Ron (received 7 referrals). The least referred person was Frank (0 referrals).

Structural Features

Table 28.0. District Wide Leader Decision Making Network Structural Features

Type of Employee
1. Rural Leader
2. Urban Leader
3. District Leader

ID	Type of Employee	Degree	Betweenness	Closeness
Ron	3	18	85.1	43
Mary	3	10	13.7	51
Dylan	3	9	16.2	52
Jennifer	3	8	5.5	54
Gavin	2	7	4.6	55
Tim	2	7	2.0	55
Pat	2	7	1.5	56
Jill	2	7	1.2	55
Tina	1	5	7.3	56
Jordan	2	5	0.4	58
Doug	3	5	0.2	57
Jim	1	4	6.8	57
Aaron	1	4	3.7	57
Ralph	1	4	3.1	63
Nathan	1	4	3.1	67
Jason	1	4	1.5	58
Annie	1	4	1.4	58
Patrick	1	4	0.8	59
Jamie	1	4	0.5	59
Frank	1	3	3.7	58
Amy	1	3	0.6	59

Degree Centrality

Degree centrality is the number of directed relationships that an actor has. An actor with high degree centrality is generally an active player in the network and is often a connector or hub in the network. Although it does not mean that they are the most connected actor in the network as they may have a large number of relationships, the majority of which might point to low-level actors (Hannenman & Riddle, 2005). The actor

with the highest degree centrality in this network is Ron who is a district level employee. In the district network above, Ron has the most direct connections in the network, making him the most active node in the network. He is a “connector” or “hub” in this network. Ron is the district level personnel responsible for handling questions and inquiries from all the administrators within the district as they work through implementing the district-wide videoconferencing initiative. He is a source of information and a bridge between the school-based administrators and the district level administrators.

District staff reported that they developed a monitoring system to follow up on the procedures and practices occurring in school as they worked through the implementation phase. The district staff reported that they aimed to work collaboratively with principals to examine and strategize to promote improvements. A part of this monitoring process was dialoging with the principals. This managerial task was delegated to Ron.

As a design component of the policy plan, the school district drew upon the formal hierarchical structure as the main channel of communicating the policy. District administrators informed principals who in turn shared the policy aim with the school staff. Centrality scores from the network analysis reflected this hierarchical flow of information as principals sought information related to the policy from Ron who was the district administrator responsible for rolling out the policy to district principals. This finding shows Ron had a strong influence on the implementation of this videoconferencing policy in relation to both district leaders and school principals. This finding is triangulated with qualitative data in which principal interviewees reported that Ron was the person that primarily delivered information about the policy to them.

Betweenness Centrality

Betweenness centrality identifies an actor's position within a network in terms of their ability to make connections to other pairs or groups in a network. An actor with a high betweenness centrality generally holds a favored or powerful position in the network. This actor usually has a greater amount of influence over what happens in a network (Hannenman & Riddle, 2005). In this particular district network, this happens to be Ron. He has one of the best locations in the network-he is between two important constituencies (the district level and school level administrators). He plays a "broker" role in the network. The good news is that he plays a powerful role in the network. The bad news is that he is a single point of failure. Without him, many of the school level administrators would be cut off from information and knowledge in district level clusters. This is easily seen as Ron is the bridge between school level and district level administrators in the process of implementing the district wide videoconferencing initiative. Ron confides that the most common communication link for him is directing principals to the appropriate district level personnel or seeking answers or clarifications to questions that principals have. Ron views the benefits of his role as twofold. First, all the principals meet with him. This provides an opportunity for all the principals to share what is and isn't working well in their schools in terms of implementing the videoconferencing policy. It also allows them to adopt any practices that they feel may benefit their staff and students. Secondly, the input that he receives from the principals is valuable feedback that he takes back to district level administrative meetings in reporting on the progress of schools in adopting the policy throughout the entire district.

Closeness Centrality

Closeness centrality measures how quickly an actor can access more actors in a network. An actor with a high closeness centrality generally has quick access to other actors in a network. They usually have a shorter path to other actors. This actor is usually close to other actors. This actor also has high visibility as to what is happening in the network (Hannenman & Riddle, 2005). In this decision making network that person happens to be Nathan, who is a senior rural leader. He has been in the position the longest and is well informed of the issues within the district. Nathan has fewer connections than Ron, yet the pattern of his direct and indirect ties allow him to access all the nodes in the network more quickly than anyone else. He has the shortest path to all others. He is close to everyone else. Nathan is in an excellent position to monitor the information flow in the network. He has the best visibility into what is happening in the network. Nathan is able to quickly interact with many other actors in the network. Nathan is in an excellent position to transmit information throughout the network.

Network Centralization

Individual network centralities provide insight into the individual's location in the network. The relationship between the centralities of all nodes can reveal much about the overall network structure.

A very centralized network is dominated by one or a few very central nodes. If these nodes are removed or damaged, the network quickly fragments into unconnected sub-networks. A highly central node can become a single point of failure. A network centralized around a well connected hub can fail abruptly if that hub is disabled or removed. Hubs are nodes with high degree and betweenness centrality.

A less centralized network has no single points of failure. It is resilient in the face of many attacks or random failures as many nodes or links can fail while allowing the remaining nodes to still reach each other over other network paths.

This network can be described as a highly centralized network in that it is dominated by one or a few very central nodes (particularly, Ron and Mary). If these nodes were removed or damaged, the network quickly fragments into unconnected sub-networks. A highly central node can become a single point of failure. A network centralized around a well connected hub can fail abruptly if that hub is disabled or removed. If Ron was removed from this network, the flow of information would be disabled and network fragmentation would occur. Because most of the information is filtered through Ron, other decisions makers don't connect independently to each other. As a result, we see a lot of isolated people unaware of what is happening elsewhere throughout the district. This makes the overall network very vulnerable to breakdown in communication and information flow.

Density

A description of the flexibility and ease of information exchange in a network depended on the network density and connectivity (Krackhardt as cited in Ibarra, 1992, p. 216). The density of a network is simply the proportion of all possible ties that are actually present. Density is defined as the sum of the ties divided by the number of possible ties (i.e. the ratio of all tie strength that is actually present to the number of possible ties). The density of a network may give us insights into such phenomena as the speed at which information diffuses among the nodes, and the extent to which actors have high levels of social capital and/or social constraint (Hannenman & Riddle, 2005). Connectivity was calculated by the degree centrality method. Actor indegrees were good indicators of the formal status that the individual has in an organization, and people with high indegrees

were usually people with know-how who gave advice (Krackhardt, 1992, p. 223). In this Nova Central School District network, Ron (18), Mary (10), Dylan (9) and Jennifer (8) had the highest indegree, indicating that these were the actors with the “know-how” in the decision making regarding the policy implementation. This gives them more informal organizational influence within the network. The interview data supported this analysis. The density for this particular network was calculated as 0.2238 which means that 22% of all the possible ties are present. This suggests a pattern of low interaction between and among district administrators and school principals. This low network density provided a description of Nova Central School District network as a relatively inflexible sparse network structure experiencing difficulty exchanging information. This low level of exchange system-wide may limit the amount of shared knowledge and information in the organization perhaps inhibiting the efforts at district wide change.

Chapter Summary

Interview data from the eleven rural principals, five urban principals and five district staff have provided some rich findings that focus on decision making and leader network. The data collected from the administrators’ interviews described the decision making and leader networking of the administrators as they implemented a district wide video conferencing policy. The quotations taken from the administrators are representative of the group of administrators interviewed. The findings from the interviews are summarized in Table 29.0.

The analysis of documents such as annual reports, board meeting minutes and policy drafting assisted the researcher in corroborating what the administrators was saying with respect to the mission, vision and values of the school district and some of its

individual schools, priorities for improvement, and goals and strategies to meet these priorities.

Table 29.0.
Summary of Responses

Conceptual framework	Rural principals	Urban principals	District administrators
Network analysis			
Structural features	<i>Centralized network anchored by one or two primary targets.</i>	<i>Small less centralized closed network.</i>	<i>Small less centralized closed network.</i>
Reason for establishing network ties	Rural principals' choice was based on having established a prior tie. Geographical proximity was also an important variable which determined with whom rural principals choose in their decision making network.	Urban principals' choice was based on sharing same school type (high school principals).	District leaders' choice was based on hierarchical structure where administrators were asked by their superior to set on the committee because of their area of specialization, purpose and/or role within the district.
Function served by network ties	<i>Acquisition of information and knowledge</i> was the most frequently cited function.	<i>Acquisition of information and knowledge</i> was the most frequently cited function.	<i>Acquisition of information and knowledge</i> was the most frequently cited function.
Bates (2000) ACTIONS Model Factors			
Bates (2000) ACTIONS model factors which influenced their decision making with regards to implementing the district wide video conferencing policy.	The rural principal leaders were most concerned about its <i>impact on teachers/learners.</i>	The urban principal leaders were most concerned about the <i>absolute and relative costs</i> associated with the district wide video conferencing policy.	The district leaders were most concerned about the <i>organizational impact</i> of the district wide video conferencing policy.
Brazer & Keller (2006) Multiple Stakeholder Decision Making Model Features			
Content of decision making	<i>Planning, coordinating and evaluating instruction and the curriculum</i> was the	<i>Strategic resourcing</i> was the top ranked decision for urban principals.	Policy guidelines and frameworks were established prior to implementation by

	top ranked decision for rural principals.		schools. <i>Centralized and decentralized decision making</i> was the top ranked decision for district administrators.
Types of data used in decision making	They used <i>data driven decision making</i> based on <i>student learning, school process, and perception data.</i>	They used <i>data driven decision making</i> based on <i>student learning data.</i>	They used <i>data driven decision making</i> based on <i>student learning and school process data.</i>
Role of the participants	Rural principal leaders reported the important role of teachers, district administrators and principals.	Urban principal leaders reported the important role of department heads, district administrators and principals.	District leaders reported the important role of teachers, district administrators and principals.
Structure and types of collaboration	Type 2 and Type 3 collaborative decision making involving <i>staff meeting</i> and <i>school council</i> structure.	Type 2 and Type 4 collaborative decision making involving <i>committee structure.</i> They involved only those stakeholders affected by the decisions.	Systems approach used in making decisions. Type 1, Type 2 and Type 4 collaborative decision making involving <i>committee structure.</i>

Chapter Five: Analysis and Implications

Introduction

The findings presented in chapter 4 are analyzed in this chapter to answer the research questions. This researcher analyzed decision making factors involved in the implementation of a district wide technology policy by district administrators and principals for similarities, differences, trends and themes from the findings. In this way, the researcher analyzed the data on decision making in implementing a district wide policy to answer the research questions posed at the outset. This was a higher foundation analysis from which the final interpretive chapter was constructed. The chapter starts with answering the research questions and ends with a summary of the findings.

Answers to the Research Questions

This researcher sought answers to these questions:

1. What were the key factors that influenced the administrators' decision making in regards to the district wide technology policy?

Sub Questions:

a. *Whom* do the administrators involve in the decision making process?

b. *How* do administrators involve others in the decision making process?

2. What are the *characteristics and functions* of the decision making networks that administrators experience when they respond to district wide school technology policy?

Sub Questions:

a. Through what mediums do administrators maintain their decision making network relationships during the integration of the district-wide policy implementation?

1. What were the key factors that influenced the administrators' decision making in regards to the district wide technology policy?

Bates (2000) ACTIONS model provided fundamental parameters for describing the features shaping most leader decisions when technology is in the mix: (a) improving access, (b) improving the quality of learning, (c) reducing the costs of education, and (d) improving the cost effectiveness of education. Bates (2000) proposed the ACTIONS (Access and flexibility, Costs, Teaching and learning, Interactivity, Organizational issues, Novelty, Speed) model when considering an educational technology. In the application of the model, decision makers must consider the impact of the proposed technology on either the student (access, novelty, speed, interactivity); the institution (cost, organizational issues, teaching functions, interactivity); or in some cases, both. When using the model it's important to consider who the intended learners are, how they will get the instruction, what will it cost, how it will be taught, what kinds of interaction will take place, what are the organizational issues, what technology will be used and finally how quickly can the latest information be delivered to the student (Bates, 2005).

The *rural leaders/decision makers* in this study considered factors such as geography and cost when making decisions regarding this district wide technology policy. The policy aimed to develop a wireless network of interactive video conferencing amongst all the schools and the district office. It was envisioned to expand current training and professional development initiatives as well as offer extra course selection to schools. The impact on teachers and learners was the most important factor considered by the rural decision makers. The ability for students to see their teacher and peers every week had the opportunity to enhance the social presence of participants and potentially could make the learning experience more positive and enjoyable for rural students. The rural decision

makers reported that their schools were most impacted in the area of offering course selection. Most urban schools had appropriate staffing to offer all courses on site. The rural schools were the ones utilizing distance education through the videoconferencing to cover their high school programming. They further added that the cost of travel to the professional development and meeting session held at the district location was more focused on the rural schools. Most of the rural schools were accessible only by ferry or plane and lost substantial time for travel. All the rural decision makers reported that this policy must consider the environment and geographical context of the school and its staff.

Also important to the rural decision makers was a concern for the nature of the learning and the nature of the learners. The dispersed geographical locations of the schools made providing access to the learning an important factor.

For *urban leaders/decision makers in the second case*, cost, including the availability of financial resources and the costs of setting up and maintaining the appropriate infrastructure was the most important factor considered. Cost for them including more than simply providing the videoconferencing equipment. It meant funding that could allow schools to create videoconferencing rooms where on-site student support could be established for high school students. It meant that schools should have access to all the necessary resources to support differentiated learning. Urban leaders referenced things such as mentor teachers and student assistants for special need students as examples.

To urban leaders/decision makers, appropriate funding allowed schools to put in place basic people and organizational support services and could be extended to include funding the development of new courses geared towards the videoconferencing mode of course delivery. Urban leaders reported that funding should address staffing. In its current delivery, teachers were required to teach students onsite as well as teach students from

another school through the videoconferencing. This increased the workload for those teachers. They had to ensure that both students on site as well as those on the videoconferencing were equally engaged. Urban leaders reported this arrangement might have limited the amount of participation from urban schools. Principals were in fact sharing their teaching staff. A better scenario for them was to see shared staffing across schools.

The *district leaders/decision makers in the third case*, considered the impact on the organization as the most important factor influencing their decision making. They reported it was important to consider the potential impact of changes to the distance learning system and how this would affect the district as a learning organization. 100% of the district leaders expressed the importance of having a clear vision with this policy, knowing where the policy is going, what it stands for, and what they are working towards. They indicated it must be viewed not as a district vision but a shared vision. The potential for increased collaboration between schools throughout the district was a district goal behind this videoconferencing policy.

Both the rural and district decision makers noted the benefit of this videoconferencing policy in decreasing the financial burden of travel and lost time away for rural staff in having to travel to the central location for professional development and meetings.

When making decisions, as highlighted within the literature by Cooper (1990) and Fleishman & Payne (1980), what constitutes the “truth” of a situation is relative within the context of that situation. Learning must take place in context. Application of theory enables the principal to learn and grow in his own work environment. Elmore (2000) pointed out “improvement is more a function of learning to do the right thing in the setting where you work” (p. 25). Sometimes it is necessary to step back and look at the problem situation

within its given environment. Decision-making situations are ever-evolving and changing. Sergiovanni (1999) claims that schools are unique environments, having their own climate and culture. In order to make effective decisions, school culture and climate must be taken into consideration. Understanding the environment or content of the situation can help provide guidance to the decision-making process. Policies and programs must be flexible to allow for the specific needs that the local context places on the principal (Hubert & West, 2002). The rural leaders stressed that this policy had the greatest influence on them. They were impacted the most in terms of having to offer core curriculum through this mode of delivery. They were the intended targets when considering minimizing lost time travelling to professional development session outside their community or at a central location. Some rural schools had more geographical challenges than others. It was within those contexts that rural leaders reported that decision making in regards to implementing the videoconferencing policy should have been more decentralized to them.

- a. Whom do district and school based administrators involve in the decision-making process?

The network map shows who thought who else mattered most in the cases for decision making about implementing the videoconferencing initiative. We can clearly see in Figures 5.0, 6.0 and 7.0 who makes up the district and school administrator decision making network on this policy (from among participating decision makers). All the leaders in this study preferred to work with their peer on this videoconferencing policy.

Perhaps the most prevalent theme that emerged from the interviews revolved around the administrator's use of *shared leadership*. Huber (2004) defines shared decision-making as involving both democracy and cooperation in aim and method to ensure decision-making success. Throughout all the interviews, administrators utilized their fellow administrators, teachers, students, school councils and parents to create a community of learners. All the

participants referenced utilizing other educational stakeholders to deal with arising problems or gather information prior to making decisions regarding the policy (although this was not evident in the network maps). The concept of shared decision-making exists prominently within the educational leadership literature (Klein, 1998). This sort of leadership allows all members of the educational community to have input in the running of the school (Huber, 2004). At the most fundamental level, without staff involvement and participation, many decision-making functions fail (Ortiz & Ogawa, 2000). Teachers are in the trenches and their information can aid in facilitating successful change attempts (Fullan & Hargreaves, 1996). All the administrators reported providing opportunities for people to lead, recognizing their strengths, and providing support. Rural leaders reported decision making was shared amongst all their school staff as the context of decisions often changed when dealing with implementation issues causing roles and responsibilities to be redistributed. Urban leaders reported sharing decision making with only those who were *affected* by the decision.

100% of the district leaders expressed the importance of having a clear vision where all the stakeholders involved know what the ultimate purpose of the policy is. The rural leaders reported that it was important for them to include the other stakeholders including teachers, students and parents. Important to them was ensuring that the people involved with the implementation of the video conferencing policy knew what the aim and intent of the policy was. The urban leaders reported that it was important for them to work with their administrative staff, having professional dialogue around pedagogy and assessment, providing time and opportunities for staff to reflect and collaborate as a team. This is supported by researchers DuFour & Marzano (2009) who state that the greatest influence the principal can make is to build the capacity of teachers to work in teams.

b. How do district and school based administrators involve others in the decision-making process?

This study mapped the organization created by decision makers who identified each other as important colleagues in making decisions to implement the district wide video conferencing policy. When choosing which peer mattered most in their decision making as it related to this policy (Tables 9.0, 15.0 and 21.0), rural leaders referenced ties based on prior tie and geographical proximity. Urban leaders referenced ties based on shared school type (urban school). It is worth noting that neither rural nor urban leaders referenced seeking principals based on performance indicators pertaining to the use of the videoconferencing system.

District leaders referenced ties based on area of specialization and purpose. For all leaders the function served by that relation was in acquisition of information and knowledge. In all cases, other stakeholders were involved in some capacity, but ultimately they preferred to work with their peers on the implementation of this policy.

Rural decision makers reported they played an important role in promoting and managing collaborative decision making where stakeholders were informed of the policy and there was opportunity to provide genuine input. This was done through their staff meetings and school council. Rural leaders reported they had a responsibility to make local school based management decisions that would enhance the learning and teaching potential of the videoconferencing policy for their students. Important to them was working to ensure staff buy-in to decisions prior to implementation. They utilized both type 2 and type 3 levels of collaboration.

Urban leaders reported they too had an important role in collaborative decision making and involving the appropriate stakeholders in the appropriate decisions. They used

a committee structure to deal with decision making with implementing this videoconferencing policy. They reported it was important to evaluate their decision making and communicate results to those affected. They involved district administrators and department heads in the consultation process prior to making implementation decisions. They utilized both type 2 and type 4 levels of collaboration.

District leaders used a systems approach in making decisions. They too used a committee structure to deal with decision making with implementing this videoconferencing policy. District leaders spoke of the mission and goals of the district and how they facilitated the implementation of this policy through the use of: (a) structures, such as leadership meetings; (b) processes, that promoted interaction and dialogue; and (c) documentation to clarify expectations and timelines. Principals commented on similar leadership practices and also commented on the role of modeling for others. Urban leaders viewed the leadership team at the school to be engaged in strategic planning practices in facilitation of plans and analysis of data to guide professional development and decision making to improve student learning.

Aside from the role of the principals in disseminating information regarding the policy, the staff meetings, school councils, and committees were the main organizational unit in which school staff interacted around the policy's content, meaning and implementation. Triangulating this finding, interview data suggests that it was during these meetings where school staff would discuss data, student work and implementation strategies. These meetings appeared to be the primary unit where the policy was understood.

District leaders described how it was important to be transparent and to make careful, principle-centered strategic decision making, particularly in dealing with change

such as with the implementation of this policy. Rural leaders emphasized the importance of trusting relationships with teachers and of valuing teachers as professionals able to make choices and take responsibility for actions. This was in reference to the important role that teachers have in using the video conferencing system to deliver instruction in the classroom. Urban leaders perceived contact with central office and school administration staff as critical to developing trusting relationships, supporting and transparent relationships. Rural leaders tried to engage in activities to build relationships by providing support to grow staff, by encouraging feedback through personal reviews or establishing school councils. They promoted professional development in a meaningful way to increase capacity and build trust, rather than engage in “top down” delivery.

Throughout the interviews, district leaders and principals always used the pronoun “we,” indicating the work they did was as part of a team (this was not evident in the network maps. In fact the network maps show many islands with little interconnectedness). District leaders reported a significant way to improve decision making and building trusting relationships was through communication. District leaders reported to be able to communicate effectively, central office staff and principals needed to increase their own understanding of the policy and data analysis and connect the district data to the school generated data.

Rural leaders emphasized the importance of a supportive relationship with teachers and commented on the need for visibility and interaction in a meaningful way with school staff. Rural and urban leaders reported the importance of understanding the needs of students and tailoring learning to them. These decision makers described learning what it meant to collaborate effectively and to increase knowledge and skills of all stakeholders as critical components of effective decision making in implementing this videoconferencing

policy. The decision makers described professional learning community structures that encouraged adult learning and working together. The participants reported the district should place more emphasis on learning of leaders through district workshops or mentoring very purposeful opportunities for leaders to learn from each other.

A theme that emerged from axial coding across the rural, urban and district interview transcripts was the idea that most leaders acknowledged the importance of collaborative decision-making. The district and urban leaders in this study considered committees important tools for effective decision-making. One administrator summed it up with this comment: “When everyone works together toward a common goal, more is accomplished and student learning is heightened” (Pat Interview, p. 3). Overall, utilizing committees allowed those leaders to involve the faculty and staff, providing these groups with “ownership” and “buy-in” of the decision-making process. Doug commented that when a committee makes a decision, it is difficult for the faculty and staff to blame the school leaders if they do not like the outcome. Using a committee to help make important decisions within the school environment prevents some faculty hostility. One leader summed up the work of committees as, “all stakeholders involved in the educational institution working towards a common good in a shared leadership mode” (Jordan Interview, p. 3). Another leader suggested that it was important to “put together a committee of people from the various groups to give them the opportunity to speak” (Ron Interview, p. 3). The urban and district leaders in this study reported utilizing a committee structure to get input from the other stakeholders (whether it was teachers, staff members, assistant principals, department heads, parents, students, etc.) to aid in their decision making.

All the participants in this study agreed that they engage in a process when dealing with the district-wide policy. The urban leaders relied more on central office personnel such as the computer support specialists and itinerants. One rural leader commented that this might be due to the fact that the urban leaders have easier access (in terms of travel) to those individuals i.e., visiting schools and providing troubleshooting (Tina Interview, p. 1). Rural leaders reported that programs such as Bomgar were allowing their school access to those kinds of services.

All the rural and urban leader participants reported relying on communication from district administrators throughout the decision making process in working with the implementation of the videoconferencing policy (this is supported in Figure 8.0 where Ron is an important gatekeeper in the network). Hirokawa (1990) suggested that communication or lack of communication during the decision-making process affects the quality of decisions. According to Hirokawa, "Communication is essential for decision-making efficacy because, among other things, it allows for members of an organization to (a) pool their information and critical resources, (b) check for errors and reject incorrect suggestions, (c) exert positive influence over the decisional preferences of others, and (d) satisfy the requisites for successful decision making or problem solving" (pp. 190-191). As important as communication has been shown to be to the decision-making process, Hirokawa and Scheerhorn (1986) reported that organizations make faulty decisions based on faulty communication. This study found that the overall district decision making network had sparse ties and limited interactions which negatively impacted communication. The network analysis displayed this network as many unconnected islands. There needs to be fewer islands and more interconnections amongst the leaders. This way the district can

pool and share resources among key decision makers and optimize communication and information flow throughout the district.

In an attempt to better manage the communication flow pertaining to the implementation of this district wide technology policy, the Nova Central School District prepared a communication protocol to assist principals. The guiding principle in their process was to have issues solved at the appropriate level to ensure timely responses from the district. It was made clear that issues should involve various levels within the organization before being brought forward to senior district administrators such as the Assistant Directors and/or Director for involvement. This communication protocol included role definitions. For example, education officers provide guidance and direction to principals on any issue that may affect student learning. The ICT manager oversaw the purchase of computer technology, renovating computer labs, policy development, software training, computer maintenance issues, security issues, and the overall development of the ICT plan for individual schools. This communication protocol went on to include a guide used to streamline information flow to assist the district in responding to schools as quickly and efficiently as possible. For example, if school principals had questions around professional development support their first line of contact was their education officer who would be responsible to answer their questions and involve the appropriate members of the district personnel as needed. Many rural leaders reported this process was too restricted and in fact, negatively impacted on their ability to make local decisions in a timely fashion. Patrick noted: “If I have a broadband problem, the ICT manager is best equipped to handle my concerns. I don’t understand why I have to go through my education officer” (Patrick Interview, p. 4).

2. What are the characteristics and functions of the decision making networks that district and school based administrators experience when they respond to district wide school technology policy?

In this study, the rural leaders had a very centralized network (see Figure 5.0) anchored by one or two primary targets (specifically, Nathan and Aaron). If those targets were removed or their tie was damaged, the network would quickly fragment into unconnected sub-networks. Rural leaders tend to seek out relatively more experienced rural leaders in the district. They reference trust in their relationship. Rural leaders were more likely to trust those in their decision making network if they had prior professional relationship with them. Advice isolates were more geographically peripheral in the district.

The urban leaders had small less centralized network (Figure 6.0) in which all the urban leaders were connected to each other within a tightly closed network. In their network, all the urban leaders had the same indegree (4), indicating that all the actors had valuable knowledge to offer to the decision making process.

The district leaders had a small less centralized closed network (Figure 7.0). The actors with the highest indegree were Ron, Mary and Doug with 4 each. These people would be the actors considered most important in decision making regarding this videoconferencing policy. Their network was hierarchical in that participants were asked by their superior to serve on the committee based on their area of specialization, purpose and their specific role within the district.

*Overall, the Nova Central network of decision makers can be described as a centralized network with the district administrators representing the core of the network and the school principals on the periphery (Figure 8.0). The overall network is **dominated by one or a few very central nodes** (particularly, Ron and Mary). If these nodes were*

removed or damaged, the network quickly fragments into unconnected sub-networks. A highly central node can become a single point of failure. A network centralized around a well connected hub can fail abruptly if that hub is disabled or removed. If Ron was removed from this network, the flow of information would be disabled and network fragmentation would occur. Ron is a bridge between school principals and district staff. So if he was removed, an important link connecting the school principals and district administrators would be disabled. *Sparse ties, limited interaction and the centralized structure of the Nova Central network negatively impacted the ability of the district to successfully implement the district wide policy.* The overall structure of the network has a centralized core of district leaders with the majority of the school principals on the periphery. This structure may reflect limited district wide implementation with principals being focused more on within group or clique communication and knowledge sharing. *With weak ties between the administrators, this network structure may constrain the overall implementation process occurring district wide.*

Triangulating this finding regarding *limited interaction among principals*, the principals voiced concerns around restricted opportunities for interaction, but there were subtle difference according to centrality and rural and urban context. One rural leader with less centrality noted that she did not, “have as many colleagues to turn to as I would like” as it seemed hard in the current climate to have time to reach out” (Annie Interview, p. 2). Interestingly, some of the rural leaders with low centrality seemed to maintain a sense of silence from engaging with the larger system. As one rural leader said, “Teaching full time along with administration duty forces me to keep my head down and try to do my job. As principals we only interact at our leadership meetings. These meetings are infrequent and always have full agendas” (Amy Interview, p. 2). Urban leaders with more centrality

seemed eager to have the chance to spend more time in professional dialogue. As one urban high school principal said: “I regularly talk with a couple of other urban high school principals and we share our stories and issues as much as we can” (Jordan Interview, p. 2). All the school principals expressed the need for more professional interaction, but underlying issues of silence related to those rural principals who are on the periphery of the network needs to be addressed.

District leaders pointed to the fact that district leaders were currently working on the development of a new strategic plan for the district. They expressed the focus of the new plan was to foster the communication process so that there could be more collaboration occurring throughout the district so that as a district they could raise student achievement through processes that foster trust and builds relationships and commitment. An interesting follow up would be to see if this truly materialized and explore the possible effects on the district decision making network and future district wide implementation processes.

- a. Through what mediums do district and school based administrators maintain their decision making relationships during the integration of the system wide policy implementation?

Given that e-mail, illuminate through CDLI and other applications were in operation on the intranet daily, only a certain number of videoconferencing units could operate simultaneously without risk of slowing down or crashing the network. 100% of the rural principals referenced connectivity problems when videoconferencing sessions and CDLI illuminate sessions occurred simultaneously. To ensure that the district stayed below the risk limits, a centralized scheduling process was established to schedule videoconferencing events. This negatively impacted the ability of principals to use this medium to connect to each other in a professional way. *Rural and urban decision makers*

reported that the restrictive centralized scheduling took away from the creation of emergent networking opportunities. Patrick commented:

As principals we often like to chat with each other over personal and administrative issues. Most times these instances are of an informal nature and are not planned in advance. If the videoconferencing system is to expand our networking capabilities then we need that local flexibility to call each other whenever we want to (Patrick interview, p. 2).

All the administrators in this study agreed that their most common means of communication were electronically mediated exchanges (phone and e-mail), but added that their preferred means would be face-to-face. They added that *geography played a major hindrance* to this reality. According to the participants, the leader networking provided them with the resources, skills, knowledge, and performance feedback necessary to be able to deal with the district-wide videoconferencing initiative. They all echoed the necessity to use technology to maintain their networking, but added the importance of being provided a venue to network with their colleagues and having the opportunity to meet face to face to expand their networks by developing new relationships.

Some of the decision-makers described a *love/hate relationship with e-mail* similar to the findings of DiPaola & Tschannen-Moran (2003). All of the principals discussed paperwork as an obstacle to focusing on their role as an instructional leader. The common threads of informal meetings, multitasking, and being deadline driven were often in response to dealing with this videoconferencing policy. At times, tasks were delegated to the secretary or other personnel in an effort to ease this requirement. Some principals mentioned that they hated checking e-mail because more times than not, it meant district administrators had more tasks handed down for them to do at the school level.

In an attempt to better manage the *communication flow* pertaining to the implementation of this particular district wide technology policy, the Nova Central School District prepared a communication protocol to assist principals. The guiding principle in their process was to have issues solved at the appropriate level to ensure timely responses from the district. This communication protocol included role definitions. This communication protocol went on to include a guide used to streamline information flow to assist the district in responding to schools as quickly and efficiently as possible. Due to the potential high number of questions/requests it was recommended by the district that e-mail be the primary source of communication between the principals and their education officer. So this district *promoted e mail as a primary means of communication during the implementation process.*

Chapter Summary

What were the *key factors* that influenced the administrators' decision making in regards to the district wide technology policy?

This study has found that the greatest factor in decision making for the rural leaders is the leader perception of the potential or existing impact on teachers and learners. The greatest factor in decision making for urban leaders is the leader perception of the potential or existing costs. The greatest factor in decision making for the district leaders is the impact on the organization.

***Whom* do the administrators involve in the decision making process?**

This study has found that rural leaders tend to seek out relatively experienced rural leaders. They reference the importance of having known or worked with that particular individual for a number of years and having geographical proximity with their school. Urban leaders had a strong preference for seeking out peer leaders whom they shared

similar school type (urban school). District leaders were chosen based on their area of specialization, purpose and their specific role within the district. For all the leaders, they preferred to work with their peers on this particular policy.

How do administrators involve others in the decision making process?

Rural leaders reported utilizing their staff meetings and school councils when getting other support staff involved in the implementation process. They utilized both type 2 and type 3 levels of collaboration. For both the urban leaders and district leaders, it meant developing committee structures. The urban leaders used type 2 and type 4 levels of collaboration. The district leaders used type 1, type 2 and type 4 levels of collaboration. Aside from the role of the principals in disseminating information regarding the policy, the staff meetings, school councils, and committees were the main organizational unit in which school staff interacted around the policy's content, meaning and implementation.

What are the characteristics and functions of the decision making networks that administrators experience when they respond to district wide school technology policy?

The rural leaders had a centralized network anchored by few primary targets. Both the urban and district leaders had a small tightly closed centralized network. Overall, the network can be described as a centralized network with sparse ties and limited interaction.

Through what mediums do administrators maintain their decision making network relationships during the integration of the district-wide policy implementation?

The video conferencing system was intended to expand networking opportunities. In an effort to minimize the risk of slowing down or crashing the district network and to ensure that the district stayed below the risk limits, a centralized scheduling process was established to schedule videoconferencing events. This restrictive centralized scheduling

took away from the creation of emergent networking opportunities. E mail became the primary means of communication during the implementation process for all the leaders.

Chapter 6: Conclusion and Implications

Introduction

This chapter presents the conclusions of this research. The significance of this research for practitioners, leaders, and scholars follows the conclusion. The chapter ends with the implications for future research.

Conclusion

This study presented descriptive and explanatory multiple case analyses demonstrating how leaders made decisions and the processes, parameters and actions they exhibited for implementing a district wide videoconferencing policy as urban, rural and district networks.

Examining the Nova Central decision making networks provides important insights into the current underlying relationships among district leaders and the ways in which these interactions may support or constrain the district wide policy implementation process.

The factors that influenced the leaders' decision making in regards to the implementation of the district wide policy were impact on teachers and learners, cost and impact on the organization. Leaders need to consider both the impact on learners and the organization.

Leaders need to build on organizational structures that will allow key decision makers to establish networks and connect. School districts need to work on building ties within administrators and different levels in the school district so that it can facilitate district wide sharing of knowledge rather than residing in isolated parts of the network. There needs to be fewer islands and more interconnectedness in the overall district network.

Implications of this Research and Contributions to Scholarly Study

In developing and implementing a district wide technology policy, effective decision making is critical to its success. This research provides practitioners, leaders and scholars with additional understanding of the factors to consider as well as the sources of information when implementing a similar technology policy.

Practitioners

Practitioners now have a list of factors to consider when they are faced with a similar technology policy. They have a starting point because the most important factors and sources of information have been identified. Practitioners need to consider the impact on the learner and the organization.

Participants acknowledged the importance of professional learning communities, opportunities for collaboration and the need for more training to increase knowledge and competent practice in teaching; leadership; and strategic planning and reporting, including the analysis of data.

Sparse ties may inhibit the transfer of best practices between schools and the district office, as those ties are not conducive to the transfer of more complex practices associated with change efforts (Cohen & Levinthal, 1990; Reagans & Zuckerman, 2001; Tsai, 2001). Knowledge transfer related to what is working well in a particular school with implementation of the videoconferencing policy needs to be diffused throughout the entire district so that all administrators are informed and there is a system wide sharing of knowledge. As network research suggests, if this tacit knowledge only resides in a peripheral corner of the network, then accessing and using that knowledge to meet organizational goals may be difficult (Kilduff & Tsai, 2003).

Network data provides insight into which individuals are in the best structural position (i.e., highly central actors) to move knowledge and practice throughout the system. Currently, while these are mostly district office administrators, it will be important over time to intentionally create opportunities for principals to play more central roles in the diffusion of knowledge and practice, as they are often closest to effective implementation processes and strategies. These well-connected individuals can serve as points of contact to lesser contacted actors supporting efforts at policy implementation and knowledge exchange (Honig, 2006). A more coordinated effort at building ties within groups of administrators and between different levels in the school district is critical to enhancing a school district's overall capacity for change (Kogut & Zander, 1996; Smylie & Evans, 2006), increasing the likelihood of successfully implementing a new district wide policy.

Leaders

Leaders in the organization need to consider how the technology policy will impact the organization's mission and performance and recognize that there will be organizational changes. The leaders needed to ensure that the technology policy supported the organization's mission. The leaders need to know the importance of strategic planning to the policy's success.

Leaders now know that they must be involvement and commitment from all the organization's employees (district staff, school administrators, teachers and students) in the decision making process. Planning (both strategic and operational) is an important part of the success of any district wide technology policy. This is consistent with the findings of other researchers (Cavalier, 2002; McAlpin & Jackson, 2000).

In this study, principals reported that it was important to create a community of learners. Rural principals expressed that a lack of time was a major road block to fully

implementing a community of learners within their school. There needs to be more time structured within those schools so that collaboration can occur. Leaders will need to build an organizational structure that will allow teams to establish networks and connect. While some examples exist of principal-principal or superintendent-superintendent networks (Elmore, 2004), strong school principal-district office administrator networks are rare and perhaps hold unrealized potential for change (Smylie & Evans, 2006). In the Nova Central network, school principals were typically on the periphery and somewhat disconnected from other principals and the 'core' district administrators. The isolation of principals from district administrators may stem from aspects of the organizational structure within the district that divides, rather than connects, district administrators and school principals. Therefore, structures that support the development of more collaborative relationships between administrators should be considered. Formally creating the opportunities and structures for these networks to develop and grow within the Nova Central School Board may support the implementation of this district wide video conferencing policy as well as future policies.

Principals understood bureaucratic elements as part of accountability recognizing the role of district administrators in developing rules, regulations and processes as part of their policy making to govern their work. In such an environment, they highlighted the importance of clarity in goals, purposeful conversations about data and collaboration as key elements in implementing the videoconferencing policy. The principals described the school working as a team, setting goals, and focusing on student improvement as keys to successful implementation of this videoconferencing policy.

The policy implementation process goes through several layers of modification prior to reaching the classroom. The policy is first introduced by the district administrators

to principals, who then interpret the policy and communicate it to their school staff. Similar to other studies (Burch & Spillane, 2004; Honig, 2008), leaders modify and arrange policy implementation resources such as information and knowledge. This suggests that principals acted upon the formal mandate of the policy in a different way that often defined how the policy was understood and ultimately implemented. It is potentially modified at meeting levels, and then finally delivered in the classroom. Although the policy was designed to be consistently implemented throughout the district, different interactions appear to modify what occurs in the individual schools and at the classroom level. This highlights the importance of examining the social structures upon which policy implementation processes are layered. Grade level, staff meetings and committees were the primary unit through which the policy was understood and implemented. The social structures within and between grade level, staff meetings and committees varied considerably. Some of the grade level and staff meetings established clear goals and a focus on improved instruction while others were described as fragmented in both planning and implementing the policy. Despite a singular district focus and emphasis on consistency, there appeared to be multiple versions of the implementation taking place at different levels of depth throughout the district. These versions seem to be related to characteristics of the leader networks underlying the teams in which the policy was implemented. This highlights the importance of social linkages as a key element in the planning and implementation of district wide policies.

Scholars

Scholars benefit from the detailed understanding of the decision-making process, including the key factors considered and the sources of support. This study noted the limitations in terms of resources (human and financial) had an impact on the planning for

policy implementation. Scholars with this information are able to focus on the policy and resource allocation issues.

Implications for Future Research

This study identified the factors and forces that influenced the decision making for individuals and collectives within a school district in responding to a district wide technology policy. This work opens the door to further research questions that fill gaps that exist in how we know decision making across districts (processes and parameters) for this researcher, other scholars, and practitioners seeking to further the knowledge about responding to a district wide policy. This case study contains limitations in its methodology framework. Although this study has provided insight into the decision making network of a school district implementing a district wide technology policy, it is a case study of one school district, which limits the generalizability of findings. It would be great to get more participation. Perhaps a change in methodology where the researcher could generate a list, do a random selection and the researcher be able to get permission to contact them directly by phone. Future research can perhaps include observations of practitioners actually making daily decisions in responding to issues as they arise. Networks are dynamics (Kilduff & Tsai, 2003) suggesting the importance of studying networks over time. Conducting longitudinal studies may allow researchers to examine the interaction between network structure, implementation of the policy and resulting outcomes over time.

Recommendations

Some types of knowledge require strong interpersonal relationships often outside the formal organization flow chart of job titles to be successfully transferred (Hansen, 1999; Krackhardt, 1992). Someone may be able to identify a colleague who has proper know-how for improving a given outcome, but they may not be able to form a necessarily

strong enough relationship with that person to actually transfer the knowledge. It is important that school districts provide opportunities for principals to network with colleagues or board staff in face to face environments to build a relationship that can be extended through technological means.

In this particular study, the school district rolled out a district wide videoconferencing policy allowing individual schools the flexibility of using the medium to best meet their individual school goals. What occurred was the individual schools implemented the policy on an institutional level (what works for their school) rather than a district level (what works for the district). The district could have done a better job of implementing the policy from a district perspective enabling all schools to share resources, staffing and students, thus creating a virtual community of practice where the benefits to all schools involved were greater than the sum of the individual school contributions. From a district perspective, centralized communication was missing so principals were unaware of all the things occurring in the district. As a result there was not effective means of sharing best practices. When you lose access to that type of information flow, principals “satisfice” by choosing from the contacts they know. In this case, that was based primarily on geographical proximity. The rural principals choose to seek advice from the principals in their particular areas with the perceived know-how information rather than searching from amongst all the principals throughout the entire district. They did so relying more on personal characteristics rather than choosing principals who were responsible for major gains in student learning.

The district needs to do a better job of establishing and promoting collaborative structures where principals can share best practices. They need to be able to look internally in their district and to do that they need to be familiar with the successes other schools are

experiencing. Many principals have connections with principals in other districts and this can lead to going outside the district to observe successes of other schools. This collaboration can take the form of videoconferencing administrators assembling as a group, individual videoconferencing teachers spending one-on-one time with each other, or entire school staff taking a day with another staff and sharing best practices. Principals should have the opportunity to learn about best practices from successful schools through their own networks and by attending district professional development sessions and conferences.

All social ties require some level of trust before they can successfully be a good source for important knowledge (Levin & Cross, 2004). Those seeking useful professional knowledge must trust that the target for advice is truly competent and is someone who can keep confidences if necessary (Chua, Ingram & Morris, 2008). Policy environments that erode trust will diminish professional networks in general, and be especially consequential for the strong ties needed to transfer useful knowledge. Policies increasing competition among leaders may in some contexts discourage knowledge transfer by narrowing networks to only focus on highly trusted others. Recent shifts in education policy aimed at creating greater school accountability have created more competition among principals for students and resources. The need for trust and sometimes confidentiality in principal advice-seeking may make face to face interactions an important component for creating strong ties. School district need to provide network structures that allow district decision makers the opportunity to get together and share information and knowledge. This way organizational learning can be expanded and a learning organization can truly develop. Without such structures, school boards will continue to limit opportunities for district administrators and principals to develop ties to only those individuals within their geographical area.

A possible suggestion to build trust may be a formal facilitated process of reporting back network data to the district administrators. Social network maps can be shared without identifying information as a way to create awareness about network structure, communication patterns, and isolated actors. This analysis can support the system in creating new linkages throughout the organization thus loosening inflexible systems (Cross & Parker, 2004; Cross et al., 2002; Kim et al., 2006). In addition, providing an opportunity to reflect on networks and engage in meaningful dialogue has the potential to open communication, develop trust and build the capacity of the school district to implement system-wide change.

Summary

This study has sought to contribute to a growing literature on school leaders' decision making networks. While the thrust of prior research in this area has looked at the structure of these networks, and especially the position of leaders within these structures, the researcher have pursued another important aspect of network approaches—namely, the factors that shape how district leaders select one another—through an analysis of observed ties. This is particularly important for informal professional networks among leaders because of the consequences that these ties have for organizational learning and potential student gains.

Prior tie and geographical proximity are the cited reasons chosen by rural principals for choosing who mattered in the decision making related to the implementation of this district wide video conferencing policy. School level factors such as similar school type matter the most for the urban principals. Yet many aspects of school level proficiency such as improved student achievement that may be attributed in part to principal leadership are non-significant.

These findings suggest that as part of their increasing role in facilitating learning (Honig, 2008), district administrators may want to actively promote principal networking. One way to do so would be to make available information on school performance in order to strengthen information flow throughout the district. Principals appear to weigh one another's personal characteristics more strongly than their school performance in whom they seek in their decision making network. While such individual characteristics such as years of experience can be one important and reliable signal of principal effectiveness, there are school level factors that may provide additional information to help principals understand who in their districts are promoting student achievement gains. Making such information available for principals could potentially optimize effective networking opportunities for increasing effective knowledge transfers. In order for knowledge to actually flow among principals throughout the entire district, advice-seeking must be accompanied by stronger and trusting ties. This required trust and tie strength may in part explain the significance of homophily in the leader network structure (Rawlings & Loeb, 2010). This study has shown that a relational approach to understanding decision making networks is possible, and that it can yield new knowledge about district decision making leader collectives.

References

- Ackerman, R.H., & Maslin-Ostrowski, P. (2002). *The wounded leader*. San Francisco, CA: Jossey-Bass.
- Adler, P.S., & Kwon, S.W. (2002). Social capital: Prospects for a new concept. *Academy of Management Journal*, 27(1), 17-40.
- Agullard, K., & Goughnour, D.S. (2006). *Central office inquiry: Assessing organization, roles, and actions to support school improvement*. WestEd, San Francisco, CA.
- Ahuja, G. (2002). Collaboration networks, structural holes and innovation: A longitudinal study. *Administrative Science Quarterly*, 45(3), 425-55.
- Aiken, J.A. (2002). The socialization of new principals: Another perspective on principal retention. *Educational Leadership Review*, 3(1), 32-40.
- Allen, K.E., & Cherrey, C. (2003). *Systemic leadership: Enriching the meaning of our work*. Washington, DC: University Press of America.
- Amundson, K.J., Fricklen, E., Maatsch, J.T., Saks, J.B., & Zakariya, S.B. (1996). *Becoming a better board member*. Arlington, VA: National School Boards Associations.
- Ashford, S.J. (1986). Feedback-seeking in individual adaptation: A resource perspective. *Academy of Management Journal*, 29(3), 465-487.
- Atkinson, M., & Coleman, W.D. (1996). Policy networks, policy communities and the problems of governance. In L. Dobuzinskis, M. Howlett & D. Laycock (Eds.), *Policy studies in Canada: The state of the art* (pp. 193-213). Toronto, ON: University of Toronto Press.
- Bakkenes, I., Brabander, D., & Imants, J. (1999). Teacher isolation and communication network analysis in primary schools. *Educational Administration Quarterly*, 35, 166-201.
- Balkundi, P., & Kilduff, M. (2005). The ties that lead: A social network approach to leadership. *The Leadership Quarterly*, 16, 941-61.
- Balkundi, P., & Kilduff, M. (2006). The ties that lead: A social network approach to leadership. *The Leadership Quarterly*, 17, 419-439.
- Barth, R. (2000). Learning to lead. In M. Fullan (Ed.), *The jossey-bass reader on educational leadership* (pp. 146-155). San Francisco, CA: Jossey-Bass.
- Barth, R. (2001). Learning to lead. In M. Fullan (Ed.), *The jossey-bass reader on educational leadership* (pp. 146-155). San Francisco, CA: Jossey-Bass.

- Bates, A. (2000). *Managing technological change: Strategies for college and university leaders*. San Francisco: Jossey-Bass.
- Bates, A. (2005). *Technology, e-learning and distance education* (2nd ed.). New York: Routledge.
- Beckner, W. (2004). *Ethics for educational leaders*. Boston, MA: Pearson.
- Bidwell, C.E., & Yasumoto, J.Y. (1999). The collegial focus: Teaching fields, collegial relationships, and instructional practice in American high schools. *Sociology of Education*, 72(4), 234-256.
- Blasé, J., & Blasé, J. (2001). *Empowering teachers: What successful principals do* (2nd ed.). Thousand Oaks, CA: Corwin Press.
- Blomeyer, R. (2002). Virtual schools and e learning in k-12 environments: Empowering policy and practice, in NCREL Policy Issues, Issue 11, April 2002. Naperville, IL: North Central Regional Educational Laboratory online at <http://www.ncrel.org/policy/pubs/pdfs/pivol11.pdf>
- Borgatti, S., Everett, M., & Freeman, L. (2002). *UCINET for windows: Software for social network analysis*. Analytic technologies. Harvard, Cambridge, MA.
- Brass, D.J. (1984). Being in the right place: A structural analysis of individual influence in an organization. *Administrative Science Quarterly*, 29, 518-539.
- Brass, D.J. (1995). A social network perspective on human resources management. *Research in personnel and human resources management* (Vol.13, 39-79). Greenwich, CT: JAI Press Inc.
- Brazer, S.D., & Keller, L.R. (2006). A conceptual framework for multiple stakeholder educational decision making. *International Journal of Education Policy & Leadership*, 1(3). Retrieved January 20, 2012 from <http://www.ijepl.org>.
- Brazer, S.D., & Keller, L.R. (2008). A design research approach to investigating educational decision making, in Kelly, A.E., Lesh, R.A., & Baek, J.Y. (Eds), *Handbook of design research methods in science, technology, engineering and mathematics learning and teaching*. Routledge/Taylor and Francis, New York, NY, 284-96.
- Bricker, L. (1994). *Designs for computer supported cooperative learning*. University of Washington. Available online at <http://www.brickware.com/lauren/pubs/general.pdf>.
- Brown, M., Boyle, B., & Boyle, T. (1999). Commonalities between perception and practice in models of school decision making in secondary schools. *School Leadership and Management*, 19(3), 319-330.

- Browne, D.J. (1990). *Decentralization and school based management*. Bristol: PA: The Falmer Press.
- Browne-Ferrigno, T., & Muth, R. (2004). Leadership mentoring in clinical practice: Role socialization, professional development, and capacity building. *Educational Administration Quarterly*, 40(4), 468-494.
- Bryk, A., & Schneider, B. (2002). *Trust in schools: A core resource for school improvement*. Russell Sage Foundation, New York, NY.
- Burch, P. & Spillane, J. (2004). *Leading from the middle, ld-level district staff and instructional improvement*. Cross City Campaign for Urban School Reform, Chicago, IL.
- Burns, J.M. (1978). *Leadership*. New York: Harper & Row Publishers.
- Burrell, G., & Morgan, G. (1979). *Sociological paradigms in organizational analysis*. Aldershot: Ashgate.
- Burrell, G., & Morgan, G. (2003). *Sociological paradigms and organizational analysis*. Burlington, VT: Ashgate.
- Burt, R.S. (1992). *Structural holes: The structure of competition*. Harvard University Press, Cambridge, MA.
- Burt, R.S. (2000). The network structure of social capital, In R.I. Sutton & B.M. Staw (Eds.), *Research in Organizational Behavior* (pp. 345-423). Greenwich, CT: JAI Press.
- Bussey, J., Bernstein, L., Higgins, S., Malebranche, D., Paranjape, A., Genaol, L., Lee, B., & Branch, W. (2000). Repaving the road to academic success: The Imerge approach to peer mentoring. *Academic Medicine*, 8(7), 674-679.
- Carmichael, P., Fox, A., McCormick, R., Procter, R., & Honour, L. (2006). Teachers' networks in and out of school. *Research Papers in Education*, 21(2), 217-34.
- Cavalier, J.C. (2002). The forgotten question in information technology strategic planning. *Planning for Higher Education*, 31(1), 5-14.
- Cawelti, G., & Protheroe, N. (2001). *High student achievement: How six school districts changed into high performance systems*. Arlington, VA: Educational Research Services.
- Cho, H., Stefanone, M., & Gay, G. (2002). *Social information sharing in a CSCL community*. Paper presented at the CSCL 2002. Boulder, CO.

- Chrispeels, J. (2004). *Learning to lead together: The promise and challenge of sharing leadership*. Sage Publications, Thousands Oaks, CA.
- Chua, R.Y.J., Ingram, P., Morris, M. (2008). From the head and the heart. Locating cognition and affect based trust in managers' professional networks. *Academy of Management Journal*, 51(3), 436-452.
- Coburn, C.E., & Russell, J.L. (2008). District policy and teachers' social networks. *Education, Evaluation and Policy Analysis*, 30(3), 203-35.
- Coburn, C.E., & Talbert, J.E. (2006). Conceptions of evidence use in school districts: Mapping the terrain. *American Journal of Education*, 112(4), 469-495.
- Cohen, W., & Levinthal, D. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 128-152.
- Cohen, D.M., March, J.G., & Olson, J.D. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly*, 17, 1-25.
- Coleman, J.S. (1990). *Foundations of social theory*. Harvard University Press, Cambridge, MA.
- Coleman, W., & Skogstad, G. (1990). *Policy communities and public policy in Canada: A structural approach*. Mississauga, ON: Copp Clark Pitman.
- Cooper, T.L. (1990). *The responsible administrator: An approach to ethics for the administrative role* (3rd ed.). San Francisco, CA: Jossey-Bass.
- Copland, M.A., & Knapp, M.S. (2006). Connecting leadership with learning: A framework for reflection, planning and action. *Association for Supervision and Curriculum Development*, Alexandria, VA.
- Corcoran, T. (2003). *The use of research evidence in instructional improvement* (CPRE Policy Brief RB-40). Philadelphia: Consortium for Public Policy in Education.
- Corcoran, T., Fuhrman, S.H., & Belcher, C.L. (2001). The district role in instructional improvement. *Phi Delta Kappan*, 83(1), pp. 78-84.
- Creswell, J.W. (1994). *Research design: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage Publications.
- Creswell, J.W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches*. 2nd ed. Thousands Oaks, CA: Sage Publications, Inc.
- Cross, R. Baker, W., & Parker, A. (2003). What creates energy in organizations? *Sloan Management Review*, 44(4), 51-7.

- Cross, R., Borgatti, S., & Parker, A. (2002). Making invisible work visible: Using social network analysis to support strategic collaboration. *California Management Review*, (442) pp. 25-46.
- Cross, R., & Parker, A. (2004). *The hidden power of social networks: Understanding how work really gets done in organizations*. Boston, MA: Harvard Business School Press.
- Crotty, M. (2003). *The foundations of social research: Meaning and perspective in the research process*. Thousand Oaks, CA: Sage.
- Cuban, L. (1999). The lure of curricular reform and its pitiful history. *Phi Delta Kappan*, 75(5), 182-185.
- Daly, A.J. (2010). *Social network theory and educational change*. Harvard Education Press. Cambridge, MA.
- Daly, A.J., & Finnigan, K. (2009). Understanding network structure to understand change strategy. *Journal of Educational Change*, 111,111-138.
- Daly, A.J., & Finnigan, K. (2010). Understanding network structure to understand change strategy. *Journal of Educational Change*, 111, 111-138.
- Daradoumis, T., Martinez, M.A., & Xhafa, F. (2004). An integrated approach for analyzing and assessing the performance of virtual learning groups. In G. de Vreede, L.A. Guerrero, G.M. Raventos (Eds.), *Lecture notes in computer science* (pp. 289-304). Berlin Heidelberg, New York: Springer.
- Datnow, A.J., & Castellano, M. (2003). Leadership and success for all, in Murphy, J., & Datnow, A. (Eds), *Leadership for school reform: Lessons from comprehensive school reform designs*. Corwin Press, Thousand Oaks, CA, 187-208.
- Datnow, A., Hubbard, L., & Mehan, H. (2002). *Extending educational reform: From one school to many*. London: Routledge Falmer.
- Davies, B. (2005). *The essentials of school leadership*. Thousand Oaks, California: SAGE Publications.
- Davis, B., & Sumara, D. (2006). *Complexity and education*. New York, NY: Lawrence Erlbaum.
- Denzin, K., & Lincoln, S. (2006). Introduction: The discipline and practice of qualitative research. In Norman K. Denzin & Yvonne S. Lincoln (Eds.), *Handbook of qualitative research* (3rd ed.). (pp.1-30). Thousand Oaks, CA: Sage.

- Dimitriadis, Y., Martinez, A., Rubia, B., Gomez, E., & Fuente, P.D. (2003). Combining qualitative evaluation and social network analysis for the study of classroom social interactions. *Elsevier Science*, 1-18.
- Dinham, S., & Scott, C. (2000). Moving into the third, outer domain of teacher satisfaction. *Journal of Educational Administration*, 38(4), 379-396.
- DiPaola, M., & Tschannen-Moran, M. (2003) The principalship at a crossroads: A study of the conditions and concerns of principals. *NASSP Bulletin*, 87(634), 43-65.
- Donmoyer, R., Imber, M., Scheurich, J.J. (1995). *The knowledge base in educational administration: Multiple perspectives*. New York: The State University of New York Press.
- Drath, W. (2001). *The deep blue sea: Rethinking the source of leadership*. San Francisco: Jossey-Bass & Center for Creative Leadership.
- Drucker, P.F. (1998). *The leader of the future*. San Francisco, CA: Jossey-Bass.
- DuFour, R., & Eaker, R. (1998). *Professional learning communities at work: Best practices for enhancing student achievement*. Bloomington, IN: National Education Service.
- DuFour, R., & Marzano, R. (2009). High-leverage strategies for principal leadership. *Educational Leadership*, 66(5), 62-68.
- Duke, D.L. (1987). *School leadership and instructional improvement*. New York: Random House.
- Duke, D.L., Isaacson, N.S., Sagor, R., & Schmuck, P.A. (1984). *Transition to leadership: An investigation of the first year principal (Transition Leadership Project)*. Portland, OR: Lewis and Clark College.
- duPlessis, V., Beshir, R., Bollman, R.D., & Clemenson, H. (2001). Definition of rural. *Rural and Small Towns Canada Analysis Bulletin*, 3(3), 1-17.
- Durrant, J., & Holden, G. (2006). *Teachers leading change: Doing research for school improvement*. Paul Chapman Publishing, London.
- Dyer, D.A., & Williams, D.M. (1987). *Developing local community leaders. Center for Volunteer Development*: Virginia Tech. Blackburg, Virginia.
- Earl, L., & Katz, S. (2007). Leadership in networked learning communities: Defining the terrain. *School Leadership and Management*, 27(3), 239-58.
- Eckman, E.W. (2004). Similarities and differences in role conflict, role commitment and job satisfaction for female and male high school principals. *Educational Administration Quarterly*, 40(3), 366-387.

- Elmore, R.F. (2000). *Building a new structure for school leadership*: Washington, DC: The Albert Shanker Institute.
- Elmore, R.F. (2004). *School reform from the inside out: Policy, practice and performance*. Cambridge, MA: Harvard Education Press.
- Elmore, R.F., & Burney, D. (1997). Investing in teacher learning: Staff development and instructional improvement in community school district #2. *National Commission on Teaching and America's Future and the Consortium for Policy Research in Education*, New York, NY.
- Etzioni, A. (1967). Mixed scanning: A third approach to decision making. *Public Administration Review*, 16, 93-106.
- Etzioni, A. (1986). Mixed scanning revised. *Public Administration Review*, 46, 8-14.
- Etzioni, A. (1989). Humble decision making. *Harvard Business Review*, 67, 122-126.
- Fernandez, R.M. (1991). Structural bases of leadership in intraorganizational networks. *Social Psychology Quarterly*, 54(1), 36-53.
- Fischer, C.D. (1986). Organizational socialization: An integrated review. *Research in Personnel and Human Resources Management*, 4, 101-145.
- Fleishman, J.L., & Payne, B.L. (1980). *Ethical dilemmas and the education of policymakers*. Hastings-on-Hudson, NY: The Hastings Center.
- Forno, A., & Merlone, U. (2007). The emergence of effective leaders: An experimental approach and computational approach. In J.Hazy, J. Goldstein, & B. Lichtenstein (Eds.), *Complex systems leadership theory* (pp. 205-277). Mansfield, MA: ISCE Publishing.
- Frank, K.A., & Zhao, Y. (2004). Subgroups as meso level entities in the social organization of schools. In L.V. Hedges & B. Schneider (eds.), *The social organization of schooling* (pp. 279-318). New York: Russell Sage Foundation.
- Frank, K.A., Zhao, Y., & Borman, K. (2004). Social capital and the diffusion of innovations within organizations: Application to the implementation of computer technology in schools. *Sociology of Education*, 77(2), 148-71.
- Freeman, L.C. (1979). Centrality in social networks: Conceptual clarification. *Social Network*, 1, 215-39.
- Friedkin, N.E. (1998). *A structural theory of social influence*. Cambridge, UK: Cambridge University Press.

- Friedkin, N.E., & Slater, M. (1994). School leadership and performance: A social network approach. *Sociology of Education*, 67, 139-57.
- Fukuyama, F. (1999). *The great disruption: Human nature and the reconstitution of social order*. New York: Free Press.
- Fullan, M. (1982). *The meaning of educational change*. Toronto: OISE Press.
- Fullan, M. (1992). *The new meaning of educational change*. New York: Teachers College Press.
- Fullan, M. (1993). *Change forces: Probing the depths of educational change*. London: The Falmer Press.
- Fullan, M. (1998). Leadership for the 21st century: Breaking the bonds of dependency. *Educational Leadership*, 55(7), 6-10.
- Fullan, M. (1999). *Change forces: The sequel*. Philadelphia, PA: Falmer Press.
- Fullan, M. (2001). *Leading in a culture of change*. San Francisco: Jossey-Bass.
- Fullan, M. (2002). The change leader. *Educational Leadership*, 59(6), 16-20.
- Fullan, M. & Hargreaves, A. (1996). *What's worth fighting for in your school?* New York: Teachers College Press.
- Fullan, M., & Stiegelbauer, S. (1991). *The new meaning of educational change*. 2nd ed. New York: Teachers College Press.
- Fuhrman, S., & Elmore, R. (1990). Understanding local control in the wake of state education reform. *Educational Evaluation and Policy Analysis*, 12(1), 82-96.
- Gall, M., Borg, W., & Hall, J. (1996). *Educational research* (6th Ed.). London, England: Longman.
- Gall, M.D., Gall, J.P., & Borg, W.R. (2003). *Educational research: An introduction*. Boston, MA: Allyn & Bacon.
- Garmoran, A., Gunter, R., & Williams, T. (2005). Professional community by design: Building social capital through teacher professional development. In L.V. Hedges & B. Schneider (Eds.), *The social organization of schooling* (pp. 111-126). New York: Russell Sage Foundation.
- Garber, D.H. (1991). *Networking among principals: A study of established practices and relationships*. Paper presented at the annual meeting of the National Conference of Professors of Educational Administrators. (ERIC Document Reproduction Service No. ED337915).

- Geertz, C. (1973). *The interruption of culture: Selected essays*. New York: Basic Books.
- Gezi, K. (1990). The role of leadership in inner city schools. *Educational Research Quarterly*, 12(4), 4-11.
- Gibbons, D.E. (2004). Friendship and advice networks in the context of changing professional values. *Administrative Science Quarterly*, 49(2), 238-262.
- Gibton, D. (2001). Once the government provided education. Now it provides information on education: Insights from what UK headteachers think of educational law regarding decentralization policy, self management and autonomy. In *The Annual Conference of the British Educational Management and Administration Society (BEMAS)*, October 5-7. Newport-Pagnell, UK.
- Gleick, J. (1999). *Faster: The acceleration of just about everything*. New York: Vintage Books.
- Goleman, D. (1995). *Educational intelligence*. New York, NY: Bantam Books.
- Government of Newfoundland and Labrador. (2004). *Government launches center for distance learning and innovation*. Available online at <http://www.gov.nl.ca/releases/2002/edu/1030n07.htm>.
- Granovetter, M.S. (1973). The strength of weak ties. *American Journal of Sociology*, 78, 1360-1380.
- Granovetter, M.S. (1974). The strength of weak ties. *American Journal of Sociology*, 78, 1360-1380.
- Granovetter, M.S. (1982). Alienation reconsidered: The strength of weak ties. *Connections*, 5, 4-16.
- Granovetter, M.S. (1986). The micro-structure of school desegregation, in Prager, J., Longshore, D., & Seeman, M. (Eds). *Desegregation research: New directions in situational analysis*. Plenum Press, New York, NY.
- Gronn, P. (2002). Distributed leadership as a unit of analysis. *Leadership Quarterly*, 13, 423-451.
- Gronn, P. (2003). Distributed leadership. In K. Leithwood and P. Hallinger (Eds.), *Second International Handbook of Educational Leadership Administration, Part 2*. (pp. 653-697). Boston, MA: Kluwer.
- Gronn, P. (2008). The future of distributed leadership. *Journal of Educational Administration*, 46(2), 141-158.

- Gunawardena, C., Lowe, C.A., & Anderson, T. (1997). Analysis of global online debate and the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research*, 17(4), 397-431.
- Hallinger, P. (1992). The evolving role of American principals: From managerial to instructional to transformational leaders. *Journal of Educational Administration*, 30(3), 35-48.
- Hallinger, P. (1998). Educational change in Southeast Asia. The challenge of creating learning systems. *Journal of Educational Administration*, 36(5), 492-509.
- Hallinger, P. (2003). Leading educational change: Reflections on the practices of instructional and transformational leaders. *Cambridge Journal of Education*, 33(3), 329-351.
- Hallinger, P., & Heck, R.H. (1996a). The principal's role in school effectiveness: An assessment of methodological progress, 1980-1995. In K. Leithwood, J. Chapman, D. Corson, P. Hallinger, & A. Hart (Eds.). *International handbook of educational leadership and administration* (pp. 723-783). The Netherlands: Kluwer Academic Publishers.
- Hallinger, P., & Heck, R.H. (1996b). Reassessing the principal's role in school effectiveness: A review of empirical research, 1980-1995. *Educational Administration Quarterly*, 32(1), 5-44.
- Hallinger, P., & Heck, R.H. (1998). Exploring the principal's contribution to school effectiveness: 1980-1995. *School Effectiveness and School Improvement*, 9, 157-191.
- Hanneman, R., & Riddle, M. (2005). *Introduction to social network methods*. University of California, Riverside, CA. Available online at <http://faculty.ucr.edu/~hanneman>.
- Hansen, M.T. (1999). The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Science Quarterly*, 44(1), 82-111.
- Hara, N., Bonk, C.J., & Angeli, C. (2000). Content analyses of online discussion in an applied educational psychology course. *Instructional Science*, 28(2), 115-152.
- Hargreaves, D.H. (2003). *Education epidemic: Transforming secondary schools through innovative networks*. Demos, London.
- Hargreaves, A., & Fullan, M. (1998). *What's worth fighting for out there?* Toronto, ON: Ontario Public School Teachers' Federation.

- Haythornthwaite, C. (2001). Tie strength and the impact of new media. *Proceedings of the 34th Annual Hawaii International Conference on Systems Sciences*. Manui, HI, January 3-7.
- Haythornthwaite, C. (2002). Building social networks via computer networks: Creating and sustaining distributed learning communities. In K.A. Renninger & W. Shumar (Eds.). *Building virtual communities: Learning and change in cyberspace* (pp. 159-190). Cambridge: Cambridge University Press.
- Henri, F. (1992). Computer conferencing and content analysis. In A.R. Kaye (Ed.). *Collaborative learning through computer conferencing*. London: Springer.
- Hightower, A. (2002). San Diego's big boom: Systemic instructional change in the central office and schools. In Hightower, A., Knapp, M.S., Marsh, J., & McLaughlin, M. (Eds.). *School districts and instructional renewal*. New York, NY: Teachers College Press, 76-93.
- Hightower, A.M., Knapp, M.S., Marsh, J.A., & McLaughlin, M.W. (2002). *School districts and instructional renewal*. Teachers College Press. New York, NY.
- Hirokawa, R.Y. (1990). The role of communication in group decision making efficacy: A task contingency perspective. *Small Group Research*, 21(2), 190-204.
- Hirokawa, R.Y., & Scheerhorn, D.R. (1986). Communication in faulty group decision making. In R.Y. Hirokawa & M.S. Poole (Eds.), *Communication and group decision making* (pp. 63-80). Beverley Hills: Sage.
- Hite, J., Rew, W., & Nsubuga, Y. (2006). Building bridges for resource acquisition: Network relationships among headteachers in Ugandan private secondary schools. *International Journal of Educational Development*, 26(5), 495-512.
- Hite, J.M., & Matthews, L.J. (2003). Assessing impact of leadership preparation programs: An analysis of the effects of student cohorts and administrative internships. *Administrator Network Development*. Paper presented at the University Council for Educational Administration Conference, Portland, OR.
- Hite, J.M., Williams, E.J., & Baugh, S.E. (2002, November). *Leadership through multiple network perspectives: An analysis of the multiple administrator networks in a public school district*. Paper presented at the University Council of Educational Administration, Pittsburgh, PA.
- Hite, J.M., Williams, E.J., & Baugh, S.E. (2005). Multiple networks of public school administrators: An analysis of network content and structure. *International Journal on Leadership in Education*, 82, 91-122.
- Hoerr, T. (1996). Collegialty: A new way to define instructional leadership. *Phi Delta Kappan*, 77(5), 380-382.

- Holbrook, S.F. (1999). *Effective decision making* (16th Rev. ed.). Princeton, NJ: *Princeton Management Association*.
- Hollingsworth, A. (2004). *The school as a professional learning community. Perspectives from Tasmanian and English schools on the essentials for creating a community of learning in schools on the essentials for creating a community of learning in a school*. Available at <http://www.ncsl.org.uk/media-93c-59-the-school-as-a-professional-learning-community.pdf>
- Honig, M. (2003). Building policy from practice: Central office administrators' roles and capacity in collaborative policy implementation. *Educational Administration Quarterly*, 39(3), 292-338.
- Honig, M. (2004). Crafting coherence: How schools strategically manage multiple, external demands. *Educational Researcher*, 33(8), 16-30.
- Honig, M. (2004b). The new middle management: The role of intermediary organizations in complex education policy implementation. *Educational Evaluative and Policy Analysis*, 26, 65-87.
- Honig, M. (2004c). Where's the up in bottom up reform? *Educational Policy*, 18(4), 527-561.
- Honig, M. (2006). Street-level bureaucracy revisited: Frontline, district central office administrators as boundary spanners in education policy implementation. *Educational Evaluation and Policy Analysis*, 28(4), 357-83.
- Honig, M. (2008). District central offices as learning organizations: How sociocultural and organizational learning theories elaborate district-central-office administrators' participation in teaching and learning improvement efforts. *American Journal of Education*, 114, 627-664.
- Honig, M.I., & Coburn, C. (2008). Evidence based decision making in school district central offices. *Educational Policy*, 22(4), Corwin Press.
- Honig, M., & Hatch, T.J. (2004). Crafting coherence: How schools strategically manage external demands. *Educational Researcher*, 33, 16-30.
- Hopkins, D., & Reynolds, D. (2001). The past, present and future of school improvement: Towards the third age. *British Educational Research Journal*, 27(4), 459-75.
- Horvat, E., Weininger, E., & Laureau, E. (2003). From social ties to social capital: Class differences in the relations between schools and parents network. *American Educational Research Journal*, 40(2), 319-51.

- Howley, C., & Eckman, J. (1997). Sustainable small schools: A handbook for rural communities. *Clearinghouse on Rural Education and Small Schools*, Charleston.
- Hoy, W.K., & Miskel, C. (2001). *Educational administration theory, research and practice* (3rd ed.). New York, NY: McGraw Hill Companies Inc.
- Hoy, W.K., & Tarter, C.J. (2004). *Administrators solving the problems of practice: Decision-making concepts, cases, and consequences* (2nd ed.). Boston, MA: Allyn and Bacon.
- Huber, M.T. (2004). Balancing acts: The scholarship of teaching and learning in academic careers. Washington, DC: *American Association for Higher Education*.
- Huber, S., & West, M. (2002). Developing school leaders: A critical review of current practices, approaches and issues, and some directions for the future. In K. Leithwood & P. Hallinger (Eds.). *Second international handbook of educational leadership and administration*. (Part 1, pp. 1071-1101). London, Great Britain: Kluwer Academic Publishers.
- Hulpia, H., Devos, G., & Van Keer, H. (2011). The relation between school leadership from a distributed perspective and teachers' organizational commitment: Examining the source of the leadership function. *Educational Administration Quarterly*, 47(5), 728-771.
- Hurwitz, Z. (2002). The super bowl. *Education Life*, 14A, 15.
- Iansiti, M. (1998). *Technology integration: Making critical choices in a dynamic world*. Boston, MA: Harvard Business School Press.
- Ibarra, H. (1992). Homophily and differential returns: Sex differences in network structure and access in an advertising firm. *Administrative Science Quarterly*, 37, 422-477.
- Ibarra, H. (1995). Race, opportunity, and diversity of social circles in managerial networks. *Academy of Management Journal*, 38, 673-703.
- Jacobsen, D.M. (2001, April). *Building different bridges: Technology integration, engaged student learning and new approaches to professional development*. Paper presented at AERA 2001: The 82nd Annual Meeting of the American Educational Research Association, Seattle, WA (online). Available online at <http://www.ucalgary.ca/~dmjacobs/aera/buildingbridges.html>
- James, C.R., Dunning, G., Connolly, M., & Elliott, T. (2007). Collaborative practice: A model of successful working in schools. *Journal of Educational Administration*, 45(5), 541-55.
- Janis, I.L., & Mann, L. (1997). *Decision making: The psychological analysis of conflict, choice and commitment*. New York: Free Press.

- Jazzar, M. (2004). Instructional or managerial leadership: The principal role! *Journal of cases in educational leadership*, 7(3), 28-34.
- Johnson, P.E., & Scollay, S.J. (2001). School based decision making councils: Conflicts, leader power and social influence in the vertical team. *Journal of Educational Administration*, 39 (1), 47-66.
- Kean, T.H. (1983). *Education in New Jersey: A blueprint for reform*.
- Kefford, R.E. (1994). *Rational or anarchic: The dilemma of choosing a model describing administrative decision making behavior*. Paper presented to the 8th International Intervisitation Programme in Educational Administration, Buffalo, NY.
- Kennedy, M.M. (1982a). Evidence and decision. In M.M. Kennedy (Eds.), *Working knowledge and other essays* (pp. 59-103). Cambridge, MA: Huron Institute.
- Kennedy, M.M. (1982b). Working knowledge. In M.M. Kennedy (Eds.), *Working knowledge and other essays* (pp. 1-28). Cambridge, MA: Huron Institute.
- Kilduff, M., & Krackhardt, D. (2008). *Interpersonal networks in organization: Cognition, personality, dynamics and culture: Structural analysis in the social sciences*. Cambridge University Press, Cambridge.
- Kilduff, M., & Tsai, W. (2003). *Social networks and organizations*. Sage Publications, London.
- Kim, D., Appleton, J.J., Christenson, S.L., & Reschly, A.L. (2006). Measuring cognitive and psychological engagement: Validation of the student engagement instrument. *Journal of School Psychology*, 44(5), 427-445.
- Kinsler, K., & Gamble, M. (2002). *Reforming schools*. Continuum, New York.
- Klein, G. (1998). *Sources of power: How people make decision*. Cambridge, MA: MIT Press.
- Kowch, E.G. (2003). *Policy networks and communities in three western Canada universities: Neo-institutional responses to a pan-institutional issue*. Unpublished dissertation, University of Saskatchewan, Saskatoon, Saskatchewan. (#0-612-80959-5).
- Kowch, E.G. (2005). The knowledge network: A fundamentally new (relational) approach to knowledge management & the study of dependent organizations. *Journal of Knowledge Management Practice*, 6, 13-17. Available online at <http://www.tlinc.com/article187.htm>

- Kowch, E.G. (2008, November). *Characteristics of high capacity, semi-autonomous teams-are you ready for this?* Paper presented at the meeting of the Association of Education Communications and Technology Annual Conference, Orlando, FL.
- Kowch, E.G. (2009). New capabilities for cyber charter school leadership: An emerging imperative for integrating educational technology and educational leadership knowledge. *Tech Trends Special Edition*, 53(1), 40-49.
- Kowch, E.G. (2013). Towards leading diverse, smarter and more adaptable organizations that learn. In J. Lewis, A. Green, & D. Surry (Eds.), *Technology as a tool for diversity leadership: Implementation and future implications* (pp. 11-34). Hershey, PA: Information Science Reference.
- Kowch, E.G. (2013). Conceptualizing the essential qualities of complex adaptive leadership: Networks that organize, *International Journal of Complexity in Leadership and Management*, 10(10), 20-30.
- Knoke, D. (1996). *Comparing policy networks*. Cambridge: Cambridge University Press.
- Kogut, B., & Zander, U. (1996). What firms do? Coordination, identity and learning. *Organization Science*, 7(5), 502-518.
- Krackhardt, D. (1990). Assessing the political landscape: Structural, cognition and power in organizations. *Administrative Science Quarterly*, 35, 342-369.
- Krackhardt, D. (1992). The strength of strong ties: The importance of philos in organizations. In N. Nohria & R. Eccles (eds.), *Network and organizations: Structures, form, and action*. 216-239. Boston, MA: Harvard Business School Press.
- Krackhardt, D., & Stern, R.N. (1998). Informal networks and organizational crises: An experimental simulation. *Social Psychology Quarterly*, 51(2), 123-140.
- Kram, K.E. (1988). *Mentoring at work: Developmental relationships in organizational life*. Lanham, MD: University Press of America.
- Laat, M.D., Lally, V., Lipponen, L., & Simons, R.J. (2006). Investigating patterns on interaction in networked learning and computer supported collaborative learning: A role for social network analysis. *International Journal of Computer Supported Collaborative Learning*, 2(1), 87-103.
- Lachat, M.A., & Smith, S. (2005). Practices that support data use in urban high schools. *Journal of Education for Students Placed at Risk*, 10, 333-350.
- Larson, A. (1992). Network dyads in entrepreneurial settings: A study of the governance of exchange processes. *Administrative Science Quarterly*, 37, 76-104.

- Leithwood, K.A. (1988). *The nature, causes, and consequences of principal's practice: A framework for research and review of recent literature*. Paper presented at the annual meeting of the American Education Research Association. Washington, D.C.
- Leithwood, K. (1992). The move toward transformational leadership. *Educational Leadership*, 49 (5), 10-13.
- Leithwood, K. (1994). Leadership for school restructuring. *Educational Administration Quarterly*, 30 (4), pp. 498-518.
- Leithwood, K. (1996). *An organizational perspective on values for leaders of future schools*. Paper presented at the Conference for Values and Educational Leadership, Toronto.
- Leithwood, K. (1999). *Changing leadership for changing times*. Philadelphia: Open University Press.
- Leithwood, K. (2000). *Understanding schools as intelligent systems*. Stanford, CT: JAJ Press.
- Leithwood, K. (2007). *Educational leadership prepared for the laboratory for student success*. Center for research in human development and education: Tempel University. Retrieved from <http://www.tempel.edu/ISS>
- Leithwood, K. (2008). *Characteristics of high performing school districts*. Prepared for the College of Alberta School Superintendents.
- Leithwood, K. Louis, K.S., Anderson, S, & Wahlstrom, K. (2004). *How leadership influences student learning*. New York, NY: Wallace Foundation.
- Leithwood, K., Steinbach, R., & Begley, P. (1992). Socialization experiences: Becoming a principal in Canada. In F.W. Parkay & G.E. Hall (Eds.). *Becoming a principal: The challenge of beginning leadership* (pp. 284-307). Boston: Allyn and Bacon.
- Leithwood, K., & Jantzi, D. (2005). Transformational leadership. In B. Davies, *The essentials of school leadership*. Thousand Oaks, CA: SAGE Publications.
- Leithwood, K., Jantzi, D., & Steinbach, R. (1999). *Changing leadership for changing times*. Buckingham, UK: Open University Press.
- Leithwood, K., Mascall, B, Strauss, T., Sacks, R., Memon, N., & Yashkina, A. (2007). Distributing leadership to make schools smarter: Taking the ego out of the system. *Leadership and Policy in Schools*, 6(1), 37-67.
- Leithwood, K., Louis, K., Anderson, S., & Wahlstrom, K. (2001). Review of research how leadership influences student learning. *Learning from Leadership Project*. Toronto, ON: Ontario Institute for Studies in Education, University of Toronto.

- Leithwood, K., Louis, K., Anderson, S., & Wahlstrom, K. (2004). *How leadership influences student learning*. Available online at <http://www.wallacefoundation.org/NR/rdonlyres/E3BCCFA5-A88B-45D3-8E27-B973732283C9/01ReviewofResearchLearningfromleadership.pdf>
- Leithwood, K., & Montgomery, D. (1986). The role of the elementary school principal in program development. *Review of Educational Research*, 52.
- Leithwood, K., & Riehl, C. (2003). What we already know about successful school leadership. *AERA Division A Task Force*. Washington, DC: AERA.
- Levin, B. (2011). *More high school graduates: How schools can save students from dropping out*. Corwin.
- Levin, D.Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science*.
- Levin, B.B., & Schrum, L. (2012). *Leading technology rich schools: Award winning models for success*. New York, NY: Teachers College Press.
- Lichtenstein, B.B., Uhl-Gien, M., Marion, R., Seers, A., Orton, J.D., & Schreiber, C. (2006). Complexity leadership theory: An interactive perspective on leading in complex adaptive systems. *ECO Issue*, 8(4), 2-12.
- Lima, J.A. (2004). Social networks in teaching. In Hernandez, F., & Goodson, I.F (Eds), *social geographies of educational change*. Kluwer Academic, Dordrecht, 29-46.
- Lima, J.A. (2007). Teachers' professional development in departmentalized, loosely coupled organizations: Lessons for school improvement from a case study of two curriculum departments. *School Effectiveness and School Improvement*, 18(3), 272-301.
- Lima, J.A. (2009). Thinking more deeply about networks in education. *Journal of Educational Change*.
- Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.
- Lindblom, C.E. (1959). The science of muddling through. *Public Administrative Review*, 19, 79-99.
- Lindblom, C.E. (1964). Contexts for change and strategy: A reply. *Public Administrative Review*, 24, 157-158.
- Lindblom, C.E. (1979). Still muddling, not yet through. *Public Administrative Review*, 39, 517-526.

- Lindblom, C.E. (1980). *The policy making process* (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Linsky, M., & Heifetz, R.A. (2002). *Leadership on the line: Staying alive through the dangers of leading*. Cambridge: Harvard Business School Press.
- Lunenburg, F.C., & Ornstein, A.C. (2000). *Educational administration: Concepts and practices* (3rd ed.). Belmont, CA: Wadsworth Thomson Learning.
- Lustick, I. (1980). Explaining the variable utility of disjointed incrementalism: Four propositions. *American Political Science Review*, 74, 342-353.
- Macmillan R.B., Meyer, M.J., & Sherman, A. (2001). *The evolving role of educational administrators*. Retrieved July 25, 2007 from http://www.cesc.ca/pceradocs/01Macmillan_etal_2.pdf
- Malenfant, E.C., Milan, A., Charron, M., & Belanger, A. (2007). *Demographic changes in Canada from 1971 to 2001 across an urban-to-rural gradient*. Ottawa: Statistics Canada.
- Malouf, D., & Schiller, E. (1995). Practice and research in special education. *Exceptional Children*, 61, 414-424.
- Manz, C.C., & Sims, H.P. (1980). Self managers as a substitute for leadership: A social learning perspective. *Academy of Management Review*, 5, 361-367.
- March, J.G. (1994). *A primer on decision-making*. New York: Free Press.
- Marion, R., & Uhl-Bien, M. (2003). Complexity theory and Al-Qaeda: Examining complex leadership. *Emergence: Complexity Issues in Organizations and Management*, 5, 56-78.
- Marks, H., & Printy, S. (2003). Principal leadership and school performance: An integration of transformational and instructional leadership. *Educational Administration Quarterly*, 39(3), 370-397.
- Marsden, P.V. (1990). Network data and measurement. In W.R. Scott & J. Blake (Eds.), *Annual review of sociology*, 16, 435-463. Palo Alto, CA: Annual Reviews.
- Marsden, P.V., & Campbell, K.E. (1984). *Measuring tie strength*. *Social Forces*, 63, 482-501.
- Marsh, J. (2002). How districts relate to states, schools and communities: A review of emerging literature. In Hightower, A., Knapp, M., Marsh, S., Julie & McLaughlin, M. (Eds.). *School districts and instructional renewal*. New York, NY: Teachers College Press, 25-40.

- Marsh, J. (2006). *Democratic dilemmas*. Albany: State University of New York Press.
- Marshall, C., & Rossman, G. (1999). *Designing qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.
- Maslach, C. (1986). *Burnout. The cost of caring*. New York: Prentice-Hall Press.
- Massell, D. (2001). The theory and practice of using data to build capacity: State and local strategies and their effects. In S.H. Fuhrman (Eds.), *From the capital to the classroom: Standards-based reform in the states. One hundredth yearbook of the national society for the study of education* (pp. 148-169). Chicago: National Society for the Study of Education.
- Massell, D., & Goertz, M. (1999). *Local strategies for building capacity: The district role in supporting instructional reform*. Paper presented at the annual meeting of the American Educational Research Association. Montreal, Canada.
- Massell, D., & Goertz, M. (2002). District strategies for building instructional capacity. In A.M. Hightower, Amy, M.S. Knapp, J.A. Michael, S., A. Marsh, Julie, & M.W. McLaughlin (Eds.). *School Districts and Instructional Renewal*. New York, NY: Teachers College Press, 43-60.
- Maxwell, J.A. (2004). *Qualitative design: An interpretive approach* (2nd ed.). Thousand Oaks, CA: Sage.
- McAlpine, A., & Jackson, J. (2000). *Change management plan implementing online delivery: A study of change management*. Brisbane, Australia: Australian National Training Authority.
- McEwan, E. (2003). *7 steps to effective instructional leadership*. Thousand Oaks, California: Corwin Press.
- McGrath, C., & Krackhardt, D. (2003). Network conditions for organizational change. *Journal of Applied Behavioral Science*, 39(3), 324-36.
- McGuire, C.H., & Tyler, R.W. (1984). Comparing the use of research in other professions with research in education. *ERIC Digest*. Retrieved from ERIC Database (SP023775).
- McLaughlin, M.W. (1991). The rand change agent study: Ten years later. In *Educational Policy Implementation*, A.R. Odden (Ed.). State University of New York Press, Albany.
- McLaughlin, M.W., & Talbert, J.E. (2002). Reforming districts. In A. Hightower, M.S. Knapp, J. Marsh, & M. McLaughlin (Eds.). *School districts and instructional renewal* (pp. 173-192). New York, NY: Teachers College Press.

- McLaughlin, M.W., & Talbert, J.E. (2003). *Reforming districts: How districts support school reform*. University of Washington, Seattle, WA.
- McLaughlin, M.W., & Talbert, J.E. (2006). *Building school based teacher learning communities: Professional strategies to improve student achievement*. New York: Teachers College Press.
- McLeod, S., Bathon, J., & Richardson, J.W. (2011). Studies of technology tool usage are not enough: A response to the articles in this special issue. *Journal of Research in Leadership in Education*, 6(5), 288-297.
- McLeod, S., & Richardson, J.W. (2011). Supporting effective teaching integration and implementation. In M. Militello and J.I. Friend (Eds.). *Principal 2.0: Technology and educational leadership*. Charlotte, NC: Information Age Publishing.
- McLuhan, M. (1964). *Understanding media: The extensions of man*. London: Routledge and Kegan Paul Limited.
- Meier, D. (1995). *The power of their ideas*. Beacon Press, Boston.
- Merriam, S.B. (1988). *Case study research in education: A quantitative approach*. San Francisco, CA: Jossey-Bass.
- Merriam, S.B. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Jossey-Bass.
- Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: A sourcebook* (2nd ed.). Thousand Oaks, CA: Sage Publications.
- Moolenaar, N.M., Daly, A.J., & Slegers, P. (2009a). Ties with potential: Social network structure and innovation in Dutch elementary schools. *European Association for Research in Learning and Instruction (EARLI)*. Amsterdam, August 25-29.
- Mooenaar, N., Daly, A.J., & Slegers, P. (2010). Ties with potential: Social network structure and innovation in Dutch school. *Teachers College Record*, 113 (9), 1983-2017.
- Moolenaar, N.M., Slegers, P., Karsten, S., & Zijlstras, B.J.H. (2009b). *A social capital perspective on professional learning communities: Linking social networks and trust*. Paper presented at the annual meeting of the American educational research association (AERA), San Francisco, CA. April 13-17.
- Moon, H. (2001). Looking forward and looking back: Integrating completion and sunk costs effects within an escalation of commitment progress decision. *Journal of Applied Psychology*, 86(1), 104-113.

- Mortimore, P. (1993). School effectiveness and the management of effective learning and teaching. *School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice*, 44(4), 290-310.
- Mullen, C., & Kochan, F. (2000). Creating a collaborative leadership network: An organic view of change. *International Journal of Leadership in Education*, 3(3), 182-200.
- Murphy, J. (1994). Transformational change and the evolving role of the principal: Early empirical evidence. In J. Murphy & K.S. Louis (Eds.), *Reshaping the principalship: Insights from transformational reform efforts* (pp. 20-53). Thousand Oaks, CA: Corwin Press.
- Murphy, J. Smylie, M., Mayrowetz, D., & Louis, K.S. (2009). The role of the principal in fostering the development of distributed leadership. *School Leadership and Management*, 29(2), 181-214.
- Murnighan, J.K. (1981). Group decision making: What strategies should you use? *Management Review*, 70, 55-64.
- Neuman, W.L. (2003). *Social research methods: Qualitative and quantitative approaches* (5th ed.). Boston: Allyn and Bacon.
- Neuman, M.E.J. (2003). Ego-centered networks and the ripple effect. *Social Networks*, 25, 83-95.
- Neuman, M., & Simmons, W. (2001). Leadership for student learning. *Phi Delta Kappan*, 82(1), 9-12.
- Neuman, D.L., Brown, R.D., & Rivers, L.S. (1983). Locus of control and evaluation use: Does sense of control affect information needs and decision making? *Studies in Educational Evaluation*, 9, 77-88.
- Nohria, N., & Eccles, R.G. (1992) Face-to-face: Making network organizations work. In N. Nohria and R.G. Eccles (Eds.), *Networks and organizations: Structure, form, and action*. Boston, MA: Harvard Business School Press.
- North Central Regional Educational Laboratory. (2002). *Engauge 21st century skills: Digital literacies for a digital age*. Available online at: <http://www.ncrel.org/engauge>
- Nucci, L.P. (2001). *Education in the moral domain*. Cambridge: Cambridge University Press.
- Nurmela, K., Lehtinen, E., & Palonen, T. (1999). *Evaluating CSCL log files by social network analysis. Proceedings of CSCL 1999* (December, 1999). Pal Alto, CA.

- Nye, K., Capelluti, J. (2003). The ABCS of decision making. *Principal Leadership*, 3(9), 8-9.
- Oblensky, N. (2010). *Complex adaptive leadership: Embracing paradox and uncertainty*. Burlington, VT: MPG Books.
- Ogawa, R.T. (1994). The institutional sources of educational reform: The case of school based management. *American Educational Research Journal*, 31.
- Ortiz, F.I., & Owaga, R.T. (2000). Site-based decision making leadership in American public schools. *Journal of Educational Administration*, 38(5), 486-499.
- Owens, R. (1998). *Organizational Behavior in Education* (6th ed.). Toronto: Allyn & Bacon.
- Owens, R.G. (2001). *Organizational behavior in education: Instructional leadership and school reform* (7th ed.). Needham Heights, MA: Allyn and Bacon.
- Palonen, T., & Hakkarainen, K. (2000). Patterns of interaction in computer supported learning: A social network analysis. In B. Fishman & S O'Connor-Divelbiss (Eds.), *Fourth International Conference of Learning Sciences* (pp. 334-339). Mahwah, NJ: Erlbaum.
- Papa, M.J. (1990). Communication network patterns and employee performance with a new technology. *Communication Research*, 17, 344-368.
- Parkay, F.W., & Currie, G. (1992). Sources of support for the beginning principal. In F.W. Parkay and G.E. Hall (Eds.), *Becoming a principal: The Challenges of beginning leadership*. Boston, MA: Allyn & Bacon.
- Parkay, F.W., & Rhodes, J. (1992). Stress and the beginning principal. In F.W. Parkay and G.E. Hall (Eds.), *Becoming a principal. The challenge of beginning leadership*. Boston, MA: Allyn & Bacon.
- Patton, M.Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage Publications.
- Patton, M.G. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, California: Sage Publications.
- Pearce, C.L., & Conger, J.A. (2003). *Shared leadership: Reframing the hows and whys of leadership*. Thousand Oaks: Sage.
- Pelgrum, W., & Anderson, R. (1999). *ICT and the emerging paradigm for lifelong learning: Worldwide educational assessment of infrastructure, goals and practices*. IEA and the University of Twent, Enschede, the Netherlands.

- Penuel, W.R., Riel, M., Korbak, C., & Means, B. (2004, April). *Investigation of a social capital approach to the adoption of reform practices*. Paper presented at the annual meeting of American Educational Research Association. San Diego, CA.
- Penuel, W.R., Riel, M.R., Krauss, A., & Frank, K.A. (2009). Analyzing teachers' professional interactions in a school as social capital: A social network approach. *Teachers College Record*, 111(1), 124-63.
- Petrides, L.A., & Guiney, S. (2002). Knowledge management for school leaders: An ecological framework for thinking schools. *Teachers College Record*, 104(8), 1702-1717.
- Pettigrew, A.M. (1985). *The awakening giant: Continuity and change in the imperial chemical industries*. New York: Blackwell.
- Pfeffer, J. (1982). *Organizations and organization theory*. Boston: Pitman.
- Phillips, S. (2003). *Rural schools: An uncertain path to college*. Available online at <http://www.connectforkids.org/node/513>.
- Pitts, V.M., & Spillane, J.P. (2009). Using social network methods to study school leadership. *International Journal of Research and Methods in Education*, 32(2), 185-207.
- Portes, A. (1998). Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1-24.
- Portner, L.S. (1997). *Principal networking: Colleague interaction in the principalship*. Unpublished dissertation, Washington State University. (UMI Number 9907114).
- Preston, J., & Whipple, M. (1997). *Teamwork makes the dream work: Families and school together*. San Diego City Schools. Available online at http://prod031.sandi.net/parent/programs/images/pdf_teamwork/cover.pre.toc.pdf
- Quick, J.C., Nelson, D.L., & Quick, J.D. (1990). *Stress and challenge at the top: The paradox of the successful executive*. Great Britain: JohnWiley & Sons.
- Quick, P.M., & Normone, A.H. (2004). Moral leadership and the 21st century. Everyone is watching-especially the students. *The Educational Forum*, 68(4), 336-347.
- Raider, H. & Krackhardt, D. (2001). Intraorganizational networks. In Joel A.C. Baum (Ed.). *Companion to organizations* (pp. 58-74). Oxford, UK: Blackwell.
- Rallis, S.F., & MacMullen, M.M. (2000). Inquiry-minded schools-opening doors for accountability. *Phi Delta Kappan*, 81(10), 766-776.

- Rawlings, C.M., & Loeb, S. (2010). *Effective linking in a principal advice network: A conceptual model and exploratory analysis*. Available online at http://cepa.stanford.edu/sites/default/files/MPS_Principal_Advice_Networks_Latest.pdf.
- Reagon, R., & McEvily, B. (2003). Network structure and knowledge transfer: The effects of cohesion and range. *Administrative Science Quarterly*, 48 (2), 240-267.
- Reagon, R., & Zuckerman, E. (2001). Networks, diversity and productivity: The social capital of R&D teams. *Organization Science*, 12, 502-517.
- Reffay, C., & Chanier, T. (2003). *Social network analysis used for modeling collaborative in distance learning groups*. Intelligent Tutoring Systems: 6th International Conference, ITS 2002, Biarritz, France and San Sebastian, Spain, June 2-7, 2002. Proceedings retrieved from <http://www.springerlink.com/content/Ogfrmknm1tyh2p6k>.
- Reuven, A., Zippy, E., Gilad, R., & Aviva, G. (2003). Network analysis of knowledge construction in asynchronous learning networks. *Journal of Asynchronous Learning Networks*, 7(3), 1-23.
- Robinson, C.M. (1988). Improving education through the application of measurement and research: A practitioner's perspective. *Applied Measurement in Education*, 1(1), 53-65.
- Rogers, E. (1995). *Diffusion of innovations* (4th ed.). New York: The Free Press.
- Roger, B. (1997). Informing the shape of curriculum: New views of knowledge and its representation in schooling. *Curriculum Studies*, 29(6), 683-710.
- Rorrer, A.K., Skrla, L., & Scheurich, J. (2008). District as institutional actors in educational reform. *Educational Administration Quarterly*, 44(3), 307-57.
- Sarason, S. (1990). *The unpredictable failure of educational reform: Can we change the course before it's too late?* San Francisco, CA: Jossey-Bass.
- Sarason, S. (1993). *You are thinking of teaching*. San Francisco: Jossey-Bass.
- Scharpf, F.W. (1997). *Games real actors play: Actor centered institutionalism in policy research*. Boulder, CO: Westview Press.
- Scheurich, J.J. (1998). Highly successful and loving, public elementary schools populated mainly by low SES children of color: Core beliefs and cultural characteristics. *Urban Education*, 33(4), 451-491.
- Schulz, M. (1992). A depletion of assets model of organizational learning. *Journal of Mathematical Sociology*, 17 (2-3), 145-173.

- Schwandt, T. (1994). Constructivist, interpretive approaches to human inquiry. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 118-137). Thousand Oaks, CA: Sage.
- Scott, J. (1991). *Social network analysis: A handbook*. Newbury Park: Sage.
- Scott, J. (2000). *Social network analysis*, 2nd ed. Sage Publishing, London.
- Scott, W.R. (2004). Reflections on a half century of organizational sociology. *Annual Review of Sociology*, 30, 1-21.
- Scott, J. (2013). *Social network analysis: A handbook (3rd Ed.)*. Los Angeles, CA: Sage.
- Sergiovanni, T.J. (1991). *The principalship: A reflective practice perspective (2nd Ed.)*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Sergiovanni, T.J. (1994). *Building community in schools*. San Francisco. Jossey-Bass.
- Sergiovanni, T.J. (1995). Administering as a moral craft. In T.J. Sergiovanni (Ed.), *Rethinking leadership: A collection of articles by Thomas J. Sergiovanni* (pp. 21-39). Boston: Allyn & Bacon.
- Sergiovanni, T.J. (1999). *Rethinking leadership: A collection of articles by Thomas J. Sergiovanni*. Arlington Heights, IL: Skylight Training and Publishing.
- Sergiovanni, T.J. (2000). *The lifeworld of leadership*. San Francisco, California: Jossey-Bass Publishers.
- Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B., Dutton, J., & Kleiner, A. (2000). *Schools that learn: A fifth discipline fieldwork for educators, parents and everyone who cares about education*. New York: Doubleday.
- Shah, P.P. (1998). Who are employees' social referents?: Using a network perspective to determine referent others. *Academy of Management Journal*, 41(3), 247-268.
- Shapiro, A.S., Benjamin, W.F., & Hunt, J.J. (1995). *Curriculum and schooling: A practitioner's guide*. Palm Springs, CA: ETC Publications.
- Sharpe, F.G. (1996). Towards a research paradigm on devolution. *Journal of Educational Administration*, 34(1), 4-23.
- Shen, D., Nuankhieo, P., Huang, X., Ameluna, C., & Laffey, J. (2008). Using social network analysis to understand sense of community in an online learning environment. *Journal of Educational Computing Research*, 39(1), 17-36.

- Short, P.M., & Greer, J.T. (2002). *Leadership in empowered teachers: Themes from innovative efforts*. Upper Saddle River, NJ: Pearson Education.
- Sills, J.H. (1978). The school principal and parent involvement. *Contemporary Education*, 50(1), 45-48.
- Silins, H., & Mulford, B. (2002). Leadership and school results. In K. Leithwood (Ed.), *The Second International Handbook of Educational Leadership and Administration* (pp. 561-612). Norwell, MA: Kluwer Academic.
- Silins, H., Zaris, S., & Mulford, B. (2002). What characteristics and processes define a school as a learning organization? Is this a useful concept to apply to schools? *International Education Journal*, 3(1). Available online at <http://ehit.flinders.edu.au/educationaliej/articles/v3n1/silins/paper.pdf>.
- Simon, B. (2001). Family involvement in high school: Predictors and effects. *NASSP Bulletin*, 85(2), 8-19.
- Sizer, T. (1993). *Horace's school: Redesigning the American high school*. Houghton-Mifflin, Boston.
- Smith, W.F., & Andrews, R.L. (1989). Instructional leadership: How principals make a difference. Alexandria, VA: *Association for Supervision and Curriculum Development*. Alexandria, VA.
- Smylie, M.A. (1997). Research on teacher leadership: Assessing the state of the art. In B.J. Biddle, T.L. Good & I.F. Goodson (Eds.). *International handbook for teachers and teaching* pp. 521-592. Dordrecht, The Netherlands: Kluwer.
- Smylie, M.A., & Evans, A.E. (2006). Social capital and the problem of implementation, in *new directions in education policy: Confronting complexity*. State University of New York Press, Albany, NY. 187-208.
- Smylie, M.A., & Hart, A.W. (1999). School leadership for teacher learning and change: A human and social capital development perspective. In J. Murphy & K.S. Louis (eds.), *Handbook of research on educational administration* (2nd ed., pp 421-441). San Francisco: Jossey Bass.
- Snipes, J., Doolittle, F., & Herlihy, C. (2002). *Foundations for success: Case studies of how urban school systems improve student achievement*. MDRC for the Council of the Great City Schools.
- Spillane, J.P. (1996). School districts matter: Local educational authorities and state instructional policy. *Educational Policy*, 1(1), 63-87.

- Spillane, J.P. (1998). State policy and the non-monolithic nature of the local district: Organizational and professional considerations. *American Educational Research Journal*, 35(1), 33-63.
- Spillane, J.P. (2005). Distributed leadership. *The Educational Forum*, 69(2), 143-150.
- Spillane, J.P., & Thompson, C.L. (1997). Reconstructing conceptions of local capacity: The local education agency's capacity for ambitious instructional reform. *Educational Evaluation and Policy Analysis*, 19(2), 185-203.
- Spradley, J.P. (1980). *Participant observation*. Holt, Rinehart & Winston, New York, NY.
- Stacey, Q. (2009). *ICT based peer and self assessment*. Available online at <http://www.nsw.ed.au>
- Stake, R.E. (2000). Case studies. In N.K. Denzin & Y.S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 435-454). Thousand Oaks, CA: Sage.
- Stein, M.K., & D'Amico, L. (2002). Inquiry at the crossroads of policy and learning: A study of a district wide literacy initiative. *Teachers College Record*, 104(7), 1313-1344.
- Stewart, J. (2006). Transformational leadership: An evolving concept examined through the works of Burns, Bass, Avolio and Leithwood. *Canadian Journal of Educational Administration and Policy*, 1-29.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*, 2nd Ed. Thousand Oaks, CA: Sage Publications.
- Stuart, T.B. (1998). Network positions and propensities to collaborate: An investigation of strategic alliance formation in a high technology industry. *Administrative Science Quarterly*, 43(3), 668-698.
- Sutherland, C., Smith, J., & Wallace, C. (2007, April). *The missing link? The coaches' role in policy translation*. Paper presented at the Annual Conference of the American Education Research Association, Chicago.
- Symlie, M.A. (1992). Teacher participation in school decision making: Assessing willingness to participate. *Educational Evaluation and Policy Analysis*, 14, 53-67.
- Symlie, M.A., & Evans, A.E. (2006). Social capital and the problem of implementation. *New directions in education policy: Confronting complexity*, 187-208.
- Symons, V.J. (1990). *Evaluation of information systems: Multiple perspectives*. Unpublished doctoral dissertation, University of Cambridge, United Kingdom.

- Synder, J. (2002). New Haven Unified School District: A teaching quality system for excellence and equity. In Hightower, Amy, Knapp, Michael, S., Marsh, J., & McLaughlin, Milbrey (eds.), *School districts and instructional renewal*. *Teachers College Press*, 94-110.
- Tarter, C.J., & Hoy, W.K. (1988). Toward a contingency theory of decision making. *Journal of Educational Administration*, 36(3), 212-228.
- Taylor, R. (1984). *Behavioral decision making*. Glenview, IL: Scott Foresman.
- Tenkasi, R., & Chesmore, M. (2003). Social networks and planned organizational change. *Journal of Applied Behavioral Science*, 39(3), 281-300.
- Togneri, W., & Anderson, S.E. (2003). Beyond islands of excellence: What districts can do to improve instruction and achievement in all schools. *The Learning First Alliance and the Association for Supervision and Curriculum Development*, Washington, DC.
- Tsai, W. (2000). Social capital strategic relatedness and the formation of intraorganizational linkages. *Strategic Management Journal*, 21, 925-939.
- Tsai, W. (2001). Knowledge transfer in intra-organizational networks: Effects of network position and absorptive capacity on business unit innovation and performance. *Academy of Management Journal*, 44, 996-1004.
- Tsai, W., & Ghoshal, S. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of Management Journal*, 41(4), 464-76.
- Tuten, E.M. (2006). *A case study of the perceived decision making practices and patterns of secondary administrators using four scenarios*. Unpublished dissertation, University of South Florida. (UMI Number 3230409).
- Tyack, D., & Cuban, D. (2002). *Tinkering toward utopia*. Harvard University Press, Cambridge.
- Underwood, J., & Underwood, G. (1990). *Computers and learning: Helping children acquire thinking skills*. Blackwell, Oxford.
- Uzzi, B. (1996). The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *American Sociological Review*, 61, 674-698.
- Uzzi, B. (1997). Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Science Quarterly*, 42(1), 35-67.

- Uzzi, B., & Lancaster, R. (2003). Relational embeddedness and learning: The case of bank loan managers and their clients. *Management Science*, 49(4), 383-399.
- Waiti, P. (2005). *Evaluation of icaupapa ara whakawhiti matauranga (KAWM)*. Wellington: Research Division, Ministry of Education.
- Wall, R., & Rinehart, J.S. (1998). School based decision making and the empowerment of secondary school teachers. *Journal of School Leadership*, 8(1), 49-64.
- Walsh-Pasco, L. (2005). *From telebubbies to teleteacher: Effective practices in videoconference teaching*. Ministry of Education 2004 efellow report. Available online at <http://www.otagonet.school.nz/docs/LWP-efellow-research-2004.pdf>.
- Walters, J., Marzano, R., & McNulty, B. (2003). Leadership that sparks learning. *Educational Leadership*, 61(7), 48-51.
- Wasserman, S. (2005). *Models and methods in social network analysis (Structural analysis in the social sciences)*. Cambridge, MA: Cambridge University Press.
- Wasserman, S., Faust, K. (1997). *Social network analysis: Methods and applications*. Cambridge: Cambridge University Press.
- Wasserman, S., & Faust, K. (1998). *Social network analysis: Methods and applications*. Cambridge University Press. New York, NY.
- Wasserman, S., & Faust, K. (1999). *Social network analysis: Methods and applications*. New York: Cambridge University Press.
- Weibe, P.B., & Murphy, P.J. (1993). Parent participation in rural schooling. In E. Newton & D. Knight (Eds.), *Understanding change in education: Rural and remote regions of Canada*. Calgary, AB: Detselig Enterprises Ltd.
- Weick, K. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly*, 21, 1-19.
- Weindling, D., & Earley, P. (1987). *Secondary headship: The first years*. Philadelphia, PA: NFER-Nelson.
- Weiss, C.H., Murphy, G.E., & Birkeland, S. (2005). An alternate route to policy influence: How evaluations affect D.A.R.E. *American Journal of Evaluation*, 26(1), 12-30.
- Wellman, B., & Gulia, M. (1997). Net surfers don't ride alone: Virtual community as community. In P. Kollock & M. Smith (Eds.), *Communities in cyberspace*. Berkeley: University of California Press.
- Wheatley, M.J. (2005). *Finding our way: Leadership for uncertain times*. San Francisco, CA: Berrett-Koehler Publishers, Inc.

- Wolcott, H.F. (1990). *Writing up qualitative research*. Newbury Park, CA: Sage.
- Wolcott, H.F. (1994). *Transforming qualitative data: Description, analysis and interpretation*. Thousand Oaks, CA: Sage.
- Yin, R.K. (1984). *Case study research: Design and methods*. Beverley Hills, CA: Sage Publications.
- Yin, R.K. (2003). *Case study research: Design and methods* (3rd ed.). Thousand Oaks, CA: Sage Publications.
- Yukl, G. (1994). *Leadership in organizations* (3rd ed.). Englewood Cliffs, NJ: Prentice-Hall.
- Zorfass, J., & Ramz, A.R. (1992). Successful technology integration: The role of communication and collaboration. *Middle School Journal*, 23(5), 39-43.

Appendix I

Terms and Definitions Informing this Study

Term	Definition and Source
Asymmetric dyad	A dyad which has an arrow between two nodes going in one direction or the other, but not both (Wasserman & Faust, 1999).
Betweenness centrality	The extent to which a particular person lies on the shortest path between one person or another. Betweenness centrality is used as a measure of ‘gatekeeping.’
Decision making	The process by which choices are made among alternatives in solving a problem (Drucker, 1998; Zey, 1992). Lunenburg and Ornstein (2000) add that decision making pervades many areas of educational leadership, such as “planning, organizing, staffing, directing, coordinating and controlling” (p. 155).
Decision making network	The various network of people/departments/agencies from whom one seeks inputs and opinions before making key or important decisions.
Degree centrality	Refers to a particular person and the number of direct ties or links they have to the other people in the network.
Dyadic level	A level of two people.
Dyadic tie	A relationship established between two people (nodes).
Extra-organizational	The dyadic tie is an established link with a person outside of the organization (in this case, the school division).
Interpersonal network	A network where the actors are people.
Inter-organizational	The dyadic tie is an established link with a person inside the organization (in this case, the school division).
Mutual or reciprocal	A dyad which has two arrows between the nodes, one going in one direction and the other going in the opposite direction.
Network density	The number of ties or links among people in the network expressed as a percentage of all possible ties. If every person is tied directly with every other person the density is 100% .
Principal	The principal of a K-12 school is the instructional and administrative leader of the institution (Browne-Ferrigno & Muth, 2004; Jazzar, 2004). Ultimately, the principal is accountable to district level supervisors and the school board for all aspects of operations at the school site (Eckman, 2004; Jazzar, 2004).
Relationship (link)	The basic building block of a social network. It implies repeated interactions (formal and informal) among two or more members.
Rural schools	Rural is defined in its broadest sense to mean regional or non-metropolitan areas. Schools are institutions where students learn. Schools are built around relationships, and the quality of

	relationships is demonstrated by the way its stakeholders communicate, support each other and work together to solve problems. Rural schools are therefore defined as schools located in towns or municipalities outside the commuting zone or larger urban centers with populations of 10,000 (duPlessis, Beshin, Bollman, and Clemenson, 2001) whose stakeholders interact to share common interests, solve problems, and support each other. Malenfant, Milan, Charron, & Belanger (2007) further define rural as countryside, rural, remote and northern depending on their distance from the urban centers.
Single directional link	The relationship link is single directional in that there is no reciprocity between the actors.
Social network	The aggregated structure of relationships among people. In this case, principal and important others, who interrelate to make important decisions (Hite, Matthews & Baugh, 2005).
Technology integration	The process of using technology to enhance teaching for learning in K-12 contexts (Iansiti, 1998).