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Central Office Data Use: A Focus on District and School Goals

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Central Office Data Use: A Focus on District and School Goals

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Dedication

To my husband, Andrew.
This journey would not be worth enduring
if it weren't for your love, kindness and patience.
I am a better person with you in my life.

And to our daughters, Addison and Emerson.
May you grow to experience the beauty
and joy of a mountain climbed.

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I share this accomplishment with each of you.

Central Office Data Use: A Focus on District and School Goals

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This study examined the data use of central office administrators working in the Curriculum and Instruction Department of a school district. The purpose of this work was to broaden the knowledge base of data use and of the integral role the central office plays in the district-wide use of data to improve teaching and learning. Two research questions guided the study: (a) How do central office personnel involved in curriculum and instruction use data to support district goals of improved student achievement, and (b) how do central office personnel involved in curriculum and instruction use data to support campus goals of improved student achievement?

A qualitative and quantitative data collection process with a single-case study approach included focus groups, individual interviews, and a survey instrument. The data from these components were coded, analyzed, and translated into themes and findings using a 9-step constant-comparative process. This process provided rich

description and a comprehensive evaluation of findings to answer the research questions.

Findings regarding the use of data within the department of curriculum and instruction at the central office revealed that administrators most often took on the role of data provider. The central office provided reports both to campuses and to comply with federal and state regulations and funding requirements; provided professional development to principals, teachers, and instructional specialists; provided information about student achievement to parents and the greater community; and encouraged the use of data and highlighted the value of data use to inform instructional choices.

Further analysis of the data revealed barriers that inhibit the systemic use of data and the ability of school districts to become truly data informed: lack of a common vision for data use, creation of data silos that reduce the ability to collaborate and make cooperative data-based decisions, too much data for consideration, and fragmented implementation of the goal-setting process.

These findings contribute to the current literature by demonstrating the importance of the central office in data use. In conclusion, what central office administrators do with data matters, and how the central office uses data to support teacher and principal quality is critical in a district focused on improving teaching and student learning.

TABLE OF CONTENTS

LIST OF TABLES	xi
LIST OF FIGURES	xii
CHAPTER 1: INTRODUCTION.....	1
Purpose of Study.....	4
Research Questions.....	5
Introduction to the Method	5
Significance of the Study	6
Limitations	7
Delimitations.....	8
Assumptions.....	9
Definition of Terms.....	9
CHAPTER 2: REVIEW OF THE LITERATURE.....	12
Introduction to Data Use.....	12
History of Data Use	14
The Data-Informed District.....	15
Calibration.....	17
Campus Leadership.....	18
Teacher Data Use.....	20
Support Structures for Data Use	21
Technology	25
Assessment.....	27
Redefined Roles of Central Office and the Reform Movement	31
Central Office Data Use.....	36
CHAPTER 3: METHODOLOGY AND PROCEDURES	44
Introduction.....	44
Natrona County School District.....	45
Setting	45
Demographics	45
District Organization.....	46
District Academic Achievement Scores	47
Recent District Data Initiatives.....	49
Research Design.....	52
Quantitative Data Collection.....	53
Qualitative Data Collection.....	56
Interview Procedure	57
Focus Group Procedure.....	58
Data Analysis	59

Analysis by Constant-Comparative Method.....	60
Steps for Overall Data Analysis.....	61
Data Analysis Procedure.....	63
CHAPTER 4: RESULTS	65
Introduction to Results.....	65
Results for Research Question 1	65
Valuation of the Data.....	66
Data Reporting.....	72
Community Involvement.....	76
Results for Research Question 2.....	78
Professional Development.....	78
Data Reporting.....	87
Goal Setting.....	94
CHAPTER 5: DISCUSSION, IMPLICATIONS, AND	
RECOMMENDATIONS.....	96
Introduction.....	96
Discussion of Major Findings.....	96
Finding 1: Central Office as Provider of Data Support	97
Finding 2: Numerous Barriers to Becoming a Data-Informed District	104
Implications.....	109
What Central Offices Do With Data Matters.....	110
How Central Offices Use Data to Assess and Enrich Teacher and Principal	
Quality Is Critical.....	117
Recommendations for Future Research.....	119
Conclusion	122
APPENDIX A: NCSD AYP 2008.....	124
APPENDIX B: WYOMING AYP GRAPH.....	126
APPENDIX C: INTERVIEW PROTOCOL.....	130
APPENDIX D: FOCUS GROUP PROTOCOL.....	133
REFERENCES.....	135
VITA.....	146

LIST OF TABLES

Table 1 Means for Professional Development Survey Items.....	85
Table 2 Analysis of Variance of Professional Development Survey Items.....	86
Table 3 Tukey’s Post Hoc Tests: Adequately Prepared to Use Data.....	87
Table 4 Means for District Data Quality Scale.....	90
Table 5 Analysis of Variance: District Data Quality Scale	91
Table 6 Tukey Post Hoc Tests: District Data Quality Scale.....	91

LIST OF FIGURES

Figure. Proficiency assessments for Wyoming Students (PAWS) statewide data for 2008.....	48
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CHAPTER 1:

INTRODUCTION

The effective use of data to improve instructional strategies and student achievement is paramount in today's schools (Coburn, Toure, & Yamashita, in press; Datnow, Park, & Wohlsetter, 2007; Earl & Katz, 2002; Schmoker, 2006). No matter if one is a 1st-grade teacher using observation data from a reading assessment to determine fluency, an 11th-grade mathematics teacher disaggregating data from a state-wide standardized test, or a human resources specialist using demographic data to forecast personnel allocations for the upcoming school year, data use has become an important component in the way that educational systems are organized.

The study of data use as it relates to educational practice gained more attention with the accountability and school reform movement of the 1990s (Earl & Fullan, 2003; Goertz, 2001). The current political spotlight on education has been focused on accountability. For the past decade, assessments that measure student achievement, and accountability for that performance, have been at the forefront of policymaker's discussions about education and much data have been collected. In the evolution of the responsibilities for central offices through the reform movement, data use has been viewed as a key component of school improvement and has resulted in schools and districts that must be able to inform their decision making with relevant data in order to demonstrate that improvement (Coburn et al., in press b; Wayman, 2005). Whereas data use before this political turn had been peripheral in schools, it is now a central focus (Bernhardt, 2004; Earl & Katz, 2002).

The current movement has ignited a concerted effort by educators at all levels to focus on data-driven decision making and to implement new processes for data use that meet the demands placed upon schools (Coburn & Talbert, 2006; Datnow et al., 2007; Honig & Coburn, 2008; Wayman, Midgley, & Stringfield, 2006). A core tenet of current reformers is to provide evidence that all students are learning. Data use, in its myriad of forms, is seen as the key to providing that evidence.

Though national and state assessments are the most common source of data thought of when referencing evidence of learning and present valuable data that should be considered, this type of assessment data is not enough for school leaders who want to make informed instructional decisions in order to improve processes that affect curriculum delivery and increase student learning. Supovitz and Klein (2003) favored the simile that relying on state standardized tests for instructional guidance is like “trying to get to the Empire State Building with a map of the United States” (p. 1). Additional data are imperative in today’s data-driven world, from a variety of sources such as formative or interim assessments, attendance, behavioral indicators, teacher observations, health and wellness history, demographics, program evaluation evidence, external research, and special program indicators.

Unfortunately, data access in school systems is often notoriously cumbersome (Wayman, Cho, & Johnston, 2007). Even though schools have been referred to as having rich stores of data (Heritage & Yeagley, 2005; Wayman, Stringfield, & Yakimowski, 2004), without the ability to recall data in a timely manner and turn the

information into actionable knowledge, even the most dedicated of data collectors are left with a daunting and time-consuming task (Doyle, 2002; Wayman et al., 2004).

Nevertheless, the research literature has provided many examples of individual campuses and departments experiencing success with data use (e.g., Copland, 2003; Datnow et al., 2007; Lachat & Smith, 2005; Wayman et al., 2006; Wayman & Stringfield, 2006b; Young, 2006). A few examples in the literature show how central administration offices use data to support campuses or educational practices across the district (Coburn et al., in press b; Corcoran, Fuhrman, & Belcher, 2001; Honig & Coburn, 2005; Wayman et al., 2007). Some researchers posit that central offices are key to providing the structures and resources to ensure data use and evidence-based practices are employed (Coburn et al., in press b; Corcoran et al., 2001).

Core to this research on central office data use is the examination of the purpose for using data to inform decision making and identification of the factors that influence data use. Research has identified key components that are of concern for data use, including a lack of resources (Coburn et al., in press b; Corcoran et al., 2001; Wayman et al., 2007), problems with searching for and incorporating evidence into decision making (Coburn, Honig, & Stein, in press; Honig & Coburn, 2008; Wayman et al., 2007), the fact that much data are ambiguous and can be interpreted in multiple legitimate ways (Coburn et al., in press b; Honig & Coburn, 2008), and ongoing pressures from stakeholders to “do something” in order to show movement on a topic (Coburn et al., in press a; Corcoran et al., 2001).

Yet research has not shown what data use processes specifically look like at the central office level. Further, data use research has not delved into the work of curriculum and instruction experts and how they interact with data in order to support the greater educational goals of a campus or district. Clearly central offices are important, and the possible positive influence on student achievement that central offices have is recognized more than ever because of the call for comprehensive implementation of data use at all levels. The present study expands the current knowledge of central office data use and how it supports the ultimate goal of education at the district and campus level: providing each child an excellent education and preparing students to become educated participants in society and in democracy.

Purpose of Study

Districts nationwide are struggling with the question of how best to use data to improve student achievement efficiently and effectively. In the era of accountability, data available to schools and the public have increased exponentially. Previous studies have evaluated the use of data on campuses and by teachers (Brunner et al., 2005; Lachat & Smith, 2005; Wayman & Stringfield, 2006b), have identified the importance of the principal in data use (Copland, 2003; Supovitz & Klein, 2003; Wayman et al., 2007) and have considered the importance of data use throughout the context of the educational system (Datnow et al., 2007; Supovitz & Klein, 2003; Wayman et al., 2007).

A review of the current literature offers a limited number of studies that look into the ways central office personnel use data to support campus and district

operations (Coburn et al., in press b; Datnow et al., 2007; Honig & Coburn, 2008; Wayman et al., 2007), though Datnow et al. (2007) acknowledged that those personnel play a critical support role and there is much to learn. Consequently, the purpose of this study is to develop a greater understanding of how central office personnel involved with curriculum and instruction use data to support educational growth at the district and campus level.

Research Questions

In order to address the purpose of the study and examine central office data use, two research questions were addressed:

1. How do central office personnel involved in curriculum and instruction use data to support district goals of improved student achievement?
2. How do central office personnel involved in curriculum and instruction use data to support campus goals of improved student achievement?

Introduction to the Method

Allowing for a greater depth and breadth of collected information, this study utilized a mixed-methodology process to investigate how central office staff use data. The setting for the current research is Natrona County School District in Wyoming. Interviews, focus groups and a survey were analyzed to assess how central office personnel use data to support the educational goals of the district. Data use is a multifaceted topic. Combining qualitative and quantitative research methods with respect to gathering information about how central office staff consider data use allows the opportunity to enrich the type of information collected and therefore create

a broader knowledge base from which to draw conclusions about data use. The results of the study are reported in both statistical summaries and a collection of individual participants' responses collected through interviews and focus group discussions.

In order to gather information about data use at the central office level, a case study design was employed. Case studies have been used widely in educational research (Merriam, 1998; Mertens, 2005). According to Merriam, the purpose of using a case study is to “gain an in-depth understanding of the situation and meaning. ...The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation” (p. 19). Many researchers have noted that the case study approach is useful in studying bounded systems (Smith, 1978), such as a single school district (Merriam, 1998; Mertens, 2005; Yin, 2003). The focus of this study was to draw together information about data use towards the purpose of discovery within the context of a bounded school system's central office; thus, this approach was suitable.

Significance of the Study

As stated previously, there is a scarcity of research about central office data use and how administrative personnel use data to support district and campus operations focused on increased student achievement. With the increased pressures of accountability from communities, the state, and the federal government, central office administration must be cognizant of their data use; thus, this research is significant in three ways.

First, this research provides an additional lens through which to view current practices of central office administration data use and expand the current knowledge in the area of central office data use. This study was intended to provide insight to districts struggling with how to use the abundant amount of data collected.

Second, this research gives an insight into one district and how it provides, and does not provide, specific resources to campuses, as individual schools face the same challenge of using data to inform educational decisions and ultimately improve the quality of instruction in the classroom.

Third, this study reveals common barriers in the movement towards becoming data informed and provides discussion for districts to navigate these hindrances to data use.

Limitations

Limitations refer to certain occurrences that might temper the findings of a study, including researcher bias and research methodology. The conclusions of this research should be viewed with particular limitations in mind. However, they are not so serious as to threaten the soundness of the findings.

The research approach to this study was a single-district case study analysis of curriculum and instruction data use. Though comprehensive in scope, the results may not be generalized to other school districts as a whole; however, the findings do add additional information to the current literature and may serve as a basis for further research on central office data use.

Some data were collected through interviews and focus groups, which designates a second limitation. Due to the nature of the qualitative paradigm, the interpretations of such data are subject to the interpretations of the researcher and may be seen as a limitation to some (Miles & Huberman, 1994).

A third limitation of the study is the general implied connotation of *data*. Though clearly defined during interviews and focus groups as any artifacts or collected information that help inform educational decisions, including teacher perspective, some participants' self-limited responses to data were about interim and summative test scores. Although the interviewers pushed to remind participants about the definition, some responses about data use revolved solely around testing data.

Delimitations

Certain delimitations of this study must be addressed. This research considers the data use of central office personnel involved with curriculum and instruction and how they use data to support campus and district operations focused on student achievement. For this study, only specific portions of the collected data from the larger research evaluation were utilized. The specific focus was centered on the central office, and campus-based staff provided additional information from which to draw conclusions. The research study focused on a single-district case and was limited to the responses of central office personnel, campus-based staff, and parents of children in the district.

Assumptions

In conducting the research it was assumed that the participants in the district spoke freely about the topic and answered survey questions without purposeful bias. It also was assumed that the participants of the research had meaningful points of view to share and that these points of view were provided without partiality.

A last assumption relates to the mixed methodology presented in this study. The researcher assumed that both the qualitative data collection processes as well as the quantitative data collection process were needed in order to understand the complete picture of the school district (Miles & Huberman, 1994), but there is no hierarchical order of favoring one collection format over another.

Definition of Terms

The following definitions were used for this study:

1. *Accountability system*: a federal or state system of standards-based education that includes explicit expectations for student learning; programming for instruction that is aligned to the expectations; assessments that measure student learning; and an accountability structure that ties assessment results to decisions for local education agencies, campuses, principals, teachers, or students.

2. *Campus operations*: any operational function housed at the campus (e.g., school) level that enables the effective implementation of teaching strategies and promotes student learning.

3. *Central office personnel* or *central office administrators*: individuals who are not assigned to a particular campus-based position, specifically including

personnel in the Department of Curriculum and Instruction and the offices that are housed within the department, including Research and Assessment, Special Education, and Gifted and Talented.

4. *Data*: “any artifacts that helped educators better understand student learning, teaching practices, educational workflow, and other aspects of how districts are run and education is conducted” (Wayman et al., 2007, p. 11).

5. *Data use*: “Systematically collecting, analyzing and interpreting various types of data to guide educational decisions at the state, district, school and classroom level for improved student achievement” (Data Use for Continuous Quality Improvement, 2007, p. 2).

6. *District operations*: any operational functions housed at the central office that revolve around curriculum and instructional practice, business operations, or administrative services.

7. *High-stakes test*: any form of testing that has crucial consequences for those involved based on the outcome.

8. *Northwest Evaluation Association (NWEA)*: an organization that provides assessments that afford educators the opportunity to monitor student academic growth over the course of a school year. NWEA may refer to the organization, the specific assessments, or the software that is provided along with the assessments to manage the data accumulated.

9. *Proficiency Assessments for Wyoming Students (PAWS)*: the state specific standardized test administered to students in Wyoming K–12 public schools.

10. *Pinnacle Gradebook*: an Excelsior Software system that provides data organization of gradebook and assessment management functions.

11. *Standardized test*: a test that is designed to be given under specific conditions that create the standard. Valid results only come from tests that have been proctored under these conditions and thereby can be used to make inferences about the student's learning as well as statistically compare to a standard such as a norm or criteria.

12. *Standards*: a common set of instructional expectations developed by national consortia, state education agencies, or local education agencies, designating what students should know and be able to do, usually outlined by grade level.

CHAPTER 2:
REVIEW OF THE LITERATURE

Introduction to Data Use

Over the past few years, school district central offices across the nation have faced increasing demands to use data in decision-making processes as data use is seen as an important tool in the school improvement process (Datnow et al., 2007; Honig & Coburn, 2008). Indeed, data that are properly collected, considered, and utilized have the potential to positively and productively change the face of education. Specifically, Coburn et al. (in press b) stated, “Curriculum and instruction have long been at the center of calls for evidence-based practice and there is an emerging consensus that school district central offices can and should play a central role in instructional improvement” (p. 5). Unfortunately, the roadmap for data use has not been devised, and a one-size-fits-all approach would not be appropriate. Data use is not a straightforward process and is extremely contextual. Data are multifaceted and ever changing (Coburn et al., in press b; Earl & Katz, 2002).

Data in the most basic form are very compelling. Earl and Katz (2002) stated, “There is probably nothing in education that garners more public attention than data about schools” (p. 1008). As consumers of data, the public can be uncomfortable with data in varied forms, and school districts struggle with how to manage and put to use the data available (Earl & Katz, 2002; Halverson, Grigg, Prichett, & Thomas, 2005).

Towards this end, researchers increasingly have been suggesting that districts approach data use from a systems perspective and endeavoring to become informed

about data at all levels (Datnow et al., 2007; Halverson et al., 2005; Wayman et al., 2007). A foundational belief of this type of data use is that data are useless unless they are processed into information and that information is used to benefit the learning and instructional environment that is the core business of educational systems (Baker, 2005). Wayman et al. (2007) called this system-wide thinking of data *the data-informed district* and maintained that a truly aligned data-informed district uses a multitude of data points to ensure student growth and achievement as determined by agreed-upon goals.

Data Use for Continuous Quality Improvement (2007) provided the definition of data use for the purpose of this study: “systematically collecting, analyzing and interpreting various types of data to guide educational decisions at the state, district, school and classroom level for improved student achievement” (p. 2). This definition has two distinct parts and mirrors the information provided by Baker (2005) and Wayman et al. (2007). Educators not only must collect and analyze data, but also must use the information garnered from data to improve student achievement.

Given the complexity of data, and the increased attention placed on using data to inform decisions at all levels, school district central offices play a key role in creating and maintaining the culture of a data-informed district. This present study investigated what data use looks like at the central office level as well as how that data use supports the greater educational goal of the district. The purpose of this literature review is to provide the historical context of data use and the reform movement as well as to review and synthesize the current literature revolving around

school district data use, its core tenets, and what is currently known about central office data use.

History of Data Use

Over the past decade, there has been a great political impetus for state education agencies, local school districts, and individual schools to collect and use the information attained by the systems to create better learning environments for students (Earl & Katz, 2002; Fullan, 2000; Goertz, 2001; Schmoker, 1999). School reform, viewed through the lens of political scrutiny, is not a new concept in the educational arena. With the landscape of reform deeply embedded in the space race of the 1950s and 1960s, the release of the National Commission on Excellence in Education (1983) report, *A Nation at Risk* and the follow-up report, *A Nation “Still” at Risk: An Educational Manifesto* (Center for Education Reform, 1998), school reform initiatives gained momentum and soon the focus turned to data.

In 1990, President George H. W. Bush, along with all of the states’ governors, adopted six goals for education that would direct educational improvement in all states. These national education goals focused on educational accountability, performance goals, and equity for all students (Goertz, 2001) and effectively began the quest for data use in a codified way. In 1994, the Elementary and Secondary Education Act was reauthorized and required states for the first time to establish performance standards in reading and mathematics, with accountability for schools based on student outcomes (U.S. Department of Education, 1994).

By January 2002, the Elementary and Secondary Education Act was reauthorized again and the No Child Left Behind Act (NCLB) was signed into law. NCLB not only required testing for all students in Grades 3–8, but also mandated that the testing data be used to measure and compare the performance of a variety of groups of students. These testing data also must be used towards the attainment of 100% proficiency in math and reading by 2014 (U.S. Department of Education, 2002). The escalating expectations set by national policy for data use is clear as well as the directive for districts and schools not only to collect data, but also to use data to show increased student performance. How central offices can play a key role in the effective and purposeful use of data resulting in marked increase in student performance levels is not as clear (Honig & Coburn, 2008).

The Data-Informed District

Educators have been collecting data about children since the inception of schooling. The most common form of data currently collected consists of grades (Heritage & Yeagley, 2005), but perhaps the data most recognized and analyzed in today's educational settings are state assessment data. With the twin mandates of equity and accountability coming from state and federal levels, many district staff define a district as data driven when they take the time to analyze state assessment results and implement new programs based on the information to improve the next set of state assessments (Bernhardt, 2004). This alone is not the goal of the data-informed district.

The data-informed district, at its most basic function, is a district where all stakeholders, including teachers, parents, students, campus administrators, district leadership, and all central offices that support teaching and learning, focus on effective application of information to improve student learning rather than merely the use of data. Wayman and Cho (2008) state that a data-informed district is one where, “data are used to support education at every level” (p 92). Data use and becoming data informed at the district and school levels can be very difficult without the proper systems in place to support the successful use of data. For a variety of reasons, many educators are wary of committing to data use, from a lack of opportunity, knowledge and time to work with useable and accurate data (Lachat & Smith, 2005; Wayman & Stringfield, 2006b), to the lack of technology (Wayman et al., 2004), to the mistrust of data due to the improper use of data to propel personal agendas (Ingram, Seashore Louis, & Schroeder, 2004).

One of the most oft-repeated suggestions for support is to have structures and a supportive culture in place so that the district can sustain a focus on data and provide timely access to important and accurate information (Ingram et al., 2004; Lachat & Smith, 2005; Wayman et al., 2006; Wayman & Stringfield, 2006a, 2006b). The following explains the key components that are intertwined within the data-informed district framework. These include calibration, campus leadership, teachers, support structures for data use, technology, and assessment.

Calibration

A uniformly organized data-informed district's first priority towards creating a supportive culture should be that any and all programming will focus on student learning and achievement. As with building any common vision, creating one that revolves around becoming more informed data users must entail widespread faculty and staff involvement (Datnow et al., 2007; Fullan, 2001; Wayman & Stringfield, 2006b). Specifically with regards to data use, Wayman et al. (2007) emphasized the importance of calibration as a link between policy and vision and the real ways a classroom works. Calibration, as defined by Wayman et al. (2006), is the development of this common vision and goals with specific regards to “defining what learning is, how instruction should be conducted for such learning, and how the assessment of such learning will take place” (p. 195) when looked at through the lens of data use. A final question of what actions will be taken based on the results of the previous three findings completes the calibration process (Wayman et al., 2007).

Ideally, along with a process such as calibration, the school district begins to develop a culture of inquiry (Earl & Katz, 2002). The philosophy of being inquiry minded and creating a culture of wonder instead of a culture of blame is essential to working with data. At the very core of this vision is the dedication to engaging in data-use practices that are not only sensible in application, but also reflective, collaborative, and exploratory.

It is important to note here that teacher perspective and judgment through observations and daily interactions with students *are* a form of data. Wayman and

Stringfield (2006b) called this contextual information combined with multiple other data sources “nonthreatening triangulation of data” (p. 559), and it is important to clarify in any discussion about data use and the data-informed district. Calibration in the broadest sense of the word includes how members of a district think and feel about *all* types of data.

Ingram et al. (2004) noted that educators have a wide variety of closely held beliefs regarding what learning is and how it will be assessed using data. Wayman et al. (2006) indicates that this is the very core reason as to why calibration is necessary; though the process of calibration is important to the data-informed district, it is not a task easily realized (Wayman et al., 2007). Nevertheless, building a foundation for data use and setting student achievement goals is a precondition for effective data-informed districts (Datnow et al., 2007; Wayman et al., 2007).

Campus Leadership

In order to get to the reflective, collaborative and exploratory use of data, key leadership must be involved. As Halverson et al. (2005) stated, the current realm of educational leadership has moved beyond the discussion of instructional versus managerial versus transformational leadership; simply put, school leaders must help to create accountable learning environments and develop practices that improve student learning based in part on the measurement of state standards.

In terms of data use to improve student achievement, researchers have suggested that effective application of data and its use toward improvements in student achievement allows campus leaders to be more fully in charge of the direction

the school moves and the success experienced (Bernhardt, 2005; Halverson et al., 2005; Schmoker, 2006). Bernhardt (2005) stated, “If a school wants to improve student learning, it has to use data” (p. 66). However, leaders must be purposeful in their choice of data to share with stakeholders (Earl & Katz, 2002). Data are powerful insofar as they are practical measures of what is needed to be communicated. Leaders must be aware of their choices and determine what data are used toward what end.

One proposal is that data should be used to achieve positive results in student achievement (Bernhardt, 2005; Schmoker, 1999) and that this should be the focus of the instructional leader. A framework for data-driven instructional systems has been offered in recent research to help leaders understand their role in instructional data use (Halverson et al., 2005). Distributed leadership strategies have been suggested as effective for district and campus leaders to accomplish the goal of using data for improved student achievement (Copland, 2003; Halverson et al., 2005).

At the campus level specifically, research has shown that data use is primarily driven by the leadership of the principal (Copland, 2003; Lachat & Smith, 2005; Wayman & Stringfield, 2006b). School leaders need to promote data use at every opportunity, both public and private, and to be champions of effective data use. Earl and Katz (2002) suggested that school leaders should be responsible for driving data use in compelling ways. However, principals and leaders must be data literate in order to be successful in this endeavor. Unfortunately, this is an area where it is suggested many principals are lacking preparation and knowledge (Earl & Fullan, 2003; Wayman et al., 2007). With data literacy also comes the ability to think

purposefully about data and to understand the difference between legitimate and unreasonable data. With this knowledge of appropriate data and the finesse of when to employ such data, a sense of urgency can be instilled about a course of action related to student achievement (Earl & Katz, 2002; Supovitz & Klein, 2003).

Teacher Data Use

Though data use at the campus level is primarily driven by the principal, teacher consideration of student data has been suggested as essential for informing instructional choices and understanding the needs of students (Wayman, 2005; Wayman & Stringfield, 2006b). Teachers have varying degrees of comfort and experience with data (Datnow et al., 2007). Often, teachers have been found to be critical of accountability data overall (Ingram et al., 2004; Lachat & Smith, 2005), but many teachers come to recognize the great benefits that data use offers when shown how it improves their ability to respond to the needs of their students (Massell, 2001).

Recent studies have shown that teachers respond to data use as long as it is easy to access and allows them to meet the needs of their diverse learners through individual professional development; adjusting instruction; and supporting conversations with other teachers, administrators, and parents (Brunner et al., 2005; Lachat & Smith, 2005; Wayman et al., 2007; Wayman et al., 2006). However, many teachers reportedly rely more on anecdotal information, intuition, or previous experience than specifically on data to make decisions (Cromey, 2000; Datnow et al., 2007; Ingram et al., 2004). Further, teachers may see data use as a burden instead of

as an opportunity to efficiently tackle the workload, particularly if computer data systems do not allow for easy access (Wayman et al., 2004).

Lachat and Smith (2005) explained that several factors influence teacher data use. Included among these factors are the types of data available to school personnel, technology and data-system capability, and structures put into place that either promote or preclude teacher use of data. Even teachers found to be indifferent toward data use may entertain the possibility when it is considered valuable and supported by the larger educational environment (Lachat & Smith, 2005; Wayman & Stringfield, 2006b).

In order for the larger educational environment to support teacher use of data, creating explicit norms and expectations at the teacher and school levels is important (Datnow et al., 2007; Wayman et al., 2007). Datnow et al. (2007) also expressed that building mutual accountability between teachers to lessen the fears associated with sharing data through collaborative teams is essential.

Support Structures for Data Use

Researchers (DuFour, Eaker, & DuFour, 2005; Schmoker, 1999; Sergiovanni, 1996) have emphasized the importance of collaboration or community building in creating a positive school culture. It has been suggested that prominent school leaders are a main catalysts for creating a collaborative community culture in schools (Sergiovanni, 1996). In terms of data use, research has suggested that educators who use data and schools that create a culture of evidence often work together towards a more collaborative supportive culture dedicated to student learning and progress

(Coburn et al., in press b; Copland, 2003; Datnow et al., 2007; Lachat & Smith, 2005; Wayman & Stringfield, 2006b).

Creating professional development and programs that support teacher and administrator use of data is an intricate engagement that involves discussion and teamwork from not only the teachers and administrators, but also curriculum and instruction experts and technology and data specialists. The goal of professional development for data use is to move from the viewpoint that schools have data to how schools can effect change with such data (Massell, 2001). However, Corcoran et al. (2001) found that the question that matters most with professional development—if it leads to change in practice or improvement in student achievement—is not always considered. Skill building, in this regard, can take many forms, including organized professional development opportunities, mentorship by a data-use expert, or collaboration between teams (Corcoran et al., 2001; Wayman et al., 2007; Wayman & Conoly, 2006). Regardless of the format, as DuFour et al. (2005) stated, “school improvement means people improvement” (p. 7).

Much has been written about professional development of teachers, campus leaders, and school district administrators (Fullan, 2001; Hawley & Valli, 1999; Hirsch, 1996; Sparks, 2002). However, a new realm of professional development revolves around data. Earl and Katz (2002) suggested that school leaders need to become “data literate” (p. 1013) in order to lead in a data-informed world and provide for the professional development of the teams they lead. Earl and Katz noted that the data-literate leader (a) thinks about the purpose of data and the audience for the data,

(b) recognizes the quality of data presented, (c) is knowledgeable about basic statistics and measurements, and (d) understands the importance of valid interpretation and application of data. These four skills will become sharpened with the practical use of data and learning how it can be transformed into valuable information for directing teacher instruction and student learning. Lachat and Smith (2005) also indicated that an early feeling of success when working with data will lead to increased use of data in the future.

Creating environments in which data use revolves around a set of established questions and agreed upon goals is potent (Lachat & Smith, 2005; Sharkey & Murnane, 2005). Support from administrators to allow time to work with data also is essential (Datnow et al., 2007; Johnson & Cheng, 2007; Lachat & Smith, 2005; Wayman et al., 2006). Copland (2003) stated that at the campus level, principals who create an ongoing culture of inquiry with specific time and space for data use are successful at building capacity for data use. Wayman et al., (2007) provided a quantitative recommendation of “at least once a week; more often is preferable” (p. 54) for time set aside for data use.

More than just time must be allotted for key data use and learning to translate them into collaborative discussions and inform instructional choices. Working with protocols and structures for how educators use data to improve teaching and learning is also important at the beginning stages of a data initiative (Boudett, City, & Murnane, 2005; Johnson & Cheng, 2007). A union between setting goals and providing time to work with data should lead to improved professional development,

and effective professional development will lead to effective data use (Lachat & Smith, 2005). However, the structures to support the training must be well thought out.

Technology must be included in the professional development discussion. Technology to access relevant data is evolving on an exponential scale. Wayman, Conoly, Gasko and Stringfield (2008) noted that new technologies “can offer unprecedented access and assemblage of learning data at the individual student level” (p. 2). However, this increased access also adds to questions of how to triangulate all data available to make informed instructional decisions. Thus, informative and practical professional development in an ongoing manner is paramount (Wayman & Cho, 2008). Creating opportunities for professional development that are outside the normal spectrum of traditional professional development opportunity offerings need to be considered and created as part of a comprehensive professional development plan crafted by the office of curriculum and development based on the needs of the district. As Fullan (2001) posited, strong professional development is not about individual training sessions, but about the “development of habits of learning” (p. 253).

In terms of collaboration, three support measures are among those that may be employed to promote data-driven collaboration: (a) collaborative data teams within districts (Johnson & Cheng, 2007; Wayman et al., 2006), (b) data coaches (Johnson & Cheng, 2007; Lachat & Smith, 2005; Wayman et al., 2007), and (c) train-the-trainer approaches at the campus level (Wayman & Conoly, 2006). Having teachers involved

at each level, including demonstrations of what collaboration will look like for each campus, will lead the way towards being a data-informed district.

Combined with district support, time, professional development, and collaboration, faculty may see an increase in professionalism, such as teacher reflection on data use and practice (Wayman & Stringfield, 2006b). This is important because data provide teachers with something concrete to reflect on, and the cycle of inquiry can continue through collaboration with other teachers, while allowing the focus to remain on adjusting instructional practices to improve student achievement.

Technology

In terms of providing supportive structures that allow for data use, Wayman and Stringfield (2006b) advocated that data must be reliable and accessibility must be well timed. Technology is thus an important consideration for district data use (Wayman et al., 2004). The technological capacity of a district encompasses infrastructure, hardware, and the ability to access data quickly and efficiently.

Data access is fundamental and requires a comprehensive student-data management system. Currently, three types of data systems are available to the public (each with its own strengths and weaknesses): (a) student information systems, (b) assessment systems, and (c) data warehouses (Baker, 2005; Wayman, 2007).

In schools that have implemented widespread and comprehensive use of data systems, Wayman and Stringfield (2006b) found that teachers experienced a greater sense of data-use efficiency; teachers indicated that they were better at facilitating student needs, adjusting current instructional practices, and collaborating with peers

at a more purposeful level through formal and informal networks. Wayman (2007) stated, “Teachers have been shown to be enthusiastic about the use of a system when it meets their needs, but are quickly dismissive of a system when they perceive it as cumbersome or not useful” (p.157). Datnow et al. (2007) found that in order to reap the benefits of data use, teachers indicated their need for district support as well as a nonthreatening environment to access the data. Not only must the culture of a school support data use, but the supporting technology also must be nonthreatening to even the most novice of data users.

Access to data is perhaps the most important component of creating a school or district that is dedicated to embracing a data-informed culture. Because data come in so many disparate forms (Wayman & Stringfield, 2006a) and are often stored in multiple locations in a district, a major obstruction to effective use of data comes at the inception of use. Access to clean and quality data is possible through district initiative, though use of qualified vendors is highly recommended in order to obtain such access (Wayman, 2007; Wayman et al., 2004). Furthermore, teachers and administrators should be greatly involved in the decision-making process for purchasing data systems (McLeod, 2005; Wayman, 2007; Wayman et al., 2007).

Integrated access to all data needs can be provided through a data warehousing system. Such a system connects student information systems, assessment programs, gradebooks, curriculum systems, and professional development management tools—along with other business systems that support the educational endeavors of a district—to help provide the access and starting point for educators to

begin to mine the data and integrate efficient and accurate data use into their daily routines (Streifer & Schumann, 2005; Wayman et al., 2004).

Finally, educators must be able to decipher between the multitude of data that are provided and to rate the usefulness and applicability of the data to the activity in which they are engaging (Datnow et al., 2007; Mintz, Fiarman, & Buffett, 2005). Indeed, recognizing the quality and purpose of data presented is one key foundation of being data literate (Earl & Katz, 2002), and research clearly has shown that data-use skills are a must (Lachat & Smith, 2005; Sharkey & Murnane, 2005; Wayman & Stringfield, 2006a; Young, 2006).

Assessment

The notion of assessment has moved away from the formative concept, whereby assessment of student progress is used daily by teachers, and toward a summative definition as accountability data become more influential (Earl & Fullan, 2003). Assessment results, be they formative or summative, provide the district, school, and teacher with powerful knowledge for guiding decision making about instructional design and delivery (Heritage, Kim, Vendlinski, & Herman, 2008; Mintz et al., 2005).

The idea of having access to relevant data does not only reference the need for clean data that are entered into systems correctly and are transferable between programs (Wayman, 2007). Access to relevant data also includes access to data that are significant to decision making (Ingram et al., 2004; Lachat & Smith, 2005; Wayman & Stringfield, 2006b). State-based accountability tests have become

increasingly important in decision making and the curriculum-alignment process (Popham, 2007), but the use of common assessments (or interim assessments) created by teams of teachers, schools, or districts has been shown to be a powerful tool for improving student achievement (Reeves, 2004). Misalignment between the written, taught, and tested curricula may result in lowered student achievement (English, 2000). Curriculum and instruction experts in districts must complete due diligence and assure alignment among the written, taught, and tested curricula that allows for relevant data to be accessed.

The data currently available to teachers from accountability and assessment systems are complex (Cromey, 2000). Data diving, whereby educators look at data starting with the macro (school or district) level and continue to the micro (student) level, and disaggregating the numbers are not enough to inform instructional practice (Earl & Fullan, 2003). Yet, student performance data receive a great deal of attention.

Supovitz and Klein (2003) noted that though students create a great deal of work each year, only a small amount is considered a valuable tool for data exploration. The key goal for data use in districts is to inform instructional and organizational practice of the teacher toward the ultimate goal of improved student achievement. Supovitz and Klein described seven key ways in which student assessment data are used by administrators and teachers for improvement processes:

1. Inform instruction.
2. Identify low-performing students and create intervention strategies.
3. Plan professional development.

4. Set targets and goals.
5. Celebrate success and accomplishments of faculty and students.
6. Reinforce school goals and priorities through visual representations.
7. Provide additional supporting evidence in discussions with parents.

Although it has been suggested that using data from benchmark assessments that are proctored system-wide and aligned to the state standards “are the most important data source for instructional decision making” (Datnow et al., 2007, p. 71), many researchers add caution. Among other concerns, Brunner et al. (2005) found that although teachers were hungry to have greater access to standardized assessment data that showed student learning, they often questioned the alignment of the standardized assessments to the standards expected to be taught.

Intertwined with benchmark testing should be the process of gathering observational and formative assessment data; holding data-driven meetings surrounding these data points can help with progress toward student achievement (Boudett et al., 2005; Datnow et al., 2007). Black and Wiliam (1998) argued that classroom teachers are the natural starting point for improved formative-assessment processes (and thus data use) because of their proximity to and daily interaction with students.

Clearly, alignment between what is taught and what is assessed results in a clearer demonstration of student learning (Heritage & Yeagley, 2005). The “how” of measurement is deeply imbedded in assessment design and implementation. The assessment cycle put forth by Baker (2005) follows five steps: (a) Select goals for

teaching, (b) prepare good assessment, (c) administer assessment, (d) score assessment, and (e) revise instruction. According to Baker, the purpose of creating an organized assessment cycle is to increase teachers' ability to help students in the learning process so that they will acquire skills more adeptly.

Working with schools and teachers to move from the framework of these five steps to the actual implementation of strategies is a difficult process. A report from the National Center for Research on Evaluation, Standards, and Student Testing (Heritage et al., 2008) stated that using data from assessments to plan subsequent instruction is apt to be one of the most difficult endeavors in which teachers engage.

Technology and data management greatly aid in the assessment cycle. Currently, teacher-based grades are the top source of data in schools (Heritage & Yeagley, 2005), yet many teachers are not proficient at creating assessments that result in those grades. An emerging set of technologies addresses the issue of creating good assessments (Baker, 2005; Wayman, 2007). Analyzing the assessment feedback, also provided through new technologies, in collaborative teams that have given the same assessment can be a powerful tool in the drive towards creating a culture of data use. Whether the assessment is a large-scale state assessment, a district-created benchmark, a collaborative team-developed test of knowledge and skills, or a teacher-created alternative assessment, revisiting the data and discussing strengths and weaknesses of student learning and teacher instruction will result in a more robust instructional execution for the next round. The use of longitudinal data from state

assessments along with contextual evidence and formative assessments allows a greater picture of student growth (Datnow et al., 2007).

Redefined Roles of Central Office and the Reform Movement

The previous section explained that much has been learned through research about the individual components of the data-informed district. Also cited is the notion that educational systems have been greatly influenced in the past three decades by federal and state mandates calling for increased accountability and reform (Elmore, 2004). Yet, there has been a shift in the focus of this accountability and comprehensive reform. No longer is the focus solely on school districts; instead, individual schools are accountable to states. Consequently, much of the recent reform movement has focused on the school level (Elmore & Fuhrman, 2001; Fullan, 2000). Schools, and thus districts looking to support schools, are searching for better ways to implement the reform process so there is capacity for sustainability (Elmore, 2004).

In fact, accountability and data have been suggested as central to the current school reform movement (Earl & Katz, 2006; Fullan, 2000). When considering school effectiveness and improvement, data use has been found to be a key asset in the overall improvement process (Chrispeels, Brown, & Castillo, 2000; Earl & Katz, 2002).

The current school reform movement is diverse in its focus and implementation. Reform of any type and magnitude requires dedicated, informed leadership at all levels and patience to allow the change process to advance fully (Collins, 2001; Fullan, 2001; Johnson, 1996; Yukl, 2006). Furthermore, change

within school systems is particularly difficult because they are perhaps the most complex of all social institutions (Hanson, 2003; Johnson, 1996). Rarely do educational reform measures start from the teacher level. Hierarchical approaches to comprehensive school reform are evident in research, and as such, reform is thwarted by lack of buy-in from stakeholders at most levels (Datnow, 2000; Datnow, Borman, Stringfield, Overman, & Castellano, 2003). Fullan (2002) noted, “Overload and fragmentation are natural tendencies of complex systems” (p. 19), and central offices may be led to embrace too many reform projects or outside innovations when faced with increasingly higher expectations for district, campus, teacher, and student success.

Because of this top-down approach and overload, innovative ideas and reform strategies often have not moved to scale, and few have shown sustainable promise beyond a few schools or classrooms (Elmore, 2004; Fullan, 2000; Schmoker, 2006). Many people, including researchers, educational leaders, and policymakers, have maintained that since reform models must focus at the school level, decentralizing the power structure of the central office in order to lead to educational improvement is imperative (Chubb & Moe, 1990; Hansen & Roza, 2005).

Site-based decision making is perhaps the most common form of decentralization, encouraged due to the increased accountability of local schools. Each site is empowered to make decisions about programming, staffing, and budgeting for the school year in order to improve student achievement. There is a balance to be found between complete decentralization and the traditional top-down

autocratic way of decision making, and either extreme may have serious disadvantages (Corcoran et al., 2001).

MacIntyre (2003) claimed that countries with a limited amount of institutional checks and balances and weak constitutional structure are characteristic of governments with either too much centralized power or highly diffused power. Either extreme can have serious disadvantages for a given country or policy-making body. A government that is too centralized allows for quick and decisive decision making that may or may not be made with the community's best interest in mind. Furthermore, rash policy making can serve to isolate and injure those it was intended to protect. A government with a diffused policy-making power is often slow to respond to the most pressing needs of a country or community. MacIntyre refers to this scenario as the power concentration paradox. The school district, far from being a country, is an institution with a number of formal and informal checks and balances but is still susceptible to the power concentration paradox.

With the movement of school autonomy and the increased ability for decision making at the campus level, some researchers placed blame on district central offices for ineffective schools, others questioned whether central offices were needed in educational systems, while still others suggested that there was little evidence to support the idea that central office functions supported student achievement at any level (Chubb & Moe, 1990; Elmore, 1993).

However, removing the central office from the picture of education reform affects change efforts (Chrispeels & González, 2006; Corcoran et al., 2001). Focusing

solely on the school, without the benefit of supports such as structured funding, district policies, and procedures, may result only in temporary adjustments and improvement of practices that are not sustainable (Fullan, 2005; Stringfield, Datnow, & Ross, 1998). Corcoran et al. (2001) found in an analysis of three large districts that “the decentralization of decision making appeared to be undermining the use of knowledge rather than promoting it” (p. 81), as weaker district guidance due to a confusion of responsibilities occurred parallel to the decision-making process being implemented at the campus level. Datnow and Stringfield (2000) argued that when the school is considered as the unit for reform, success can be found, but in order for systemic reform to be ultimately effective and sustainable at the school level, support must be triangulated to include the district, state, and federal levels.

Further educational research has shown district offices as central to the school reform movement and supportive agents of change for campuses looking to improve student achievement (Chrispeels & González, 2006; MacIver & Farley, 2003; Marsh, 2000; Skrla, Scheurich, & Johnson, 2000). After completing a thorough review of central office literature, Marsh found that studies overwhelmingly found central offices as “proactive agents of change” (p. 8) and should be seen as core components of the reform and change process instead of ancillary. Further, Marsh found a theme of the research on district–school relationships that linked district procedures to student performance. The central office factors that most influence student performance through Marsh’s review of the literature included capacity building,

balance between central authority and school autonomy, understanding of the reform process, and district leadership ability.

Skrla et al. (2000) studied four high-performing districts in Texas that served student populations from low-income homes and children of color. They found that several district factors affected student performance and academic achievement for all students, including a sense of urgency to improve education for each student; the embraced concept by every employee of the district that student performance and achievement were everyone's responsibility; a shared vision of the central office as a support entity that provided key services for schools and a provider of professional development that was research based; and curriculum that was aligned to state standards as well as instruction, instructional design and delivery, and assessment.

Even with the most progressive of reform strategies, certain functions are still core to the central office in the majority of districts across the country, and central office staff play an integral part in improving student achievement (Datnow et al., 2007; Elmore & Burney, 1997; Iatarola & Frutcher, 2004; MacIver & Farley, 2003; Skrla et al., 2000; Snipes, Dolittle, & Herlihy, 2002). Central offices provide important information to schools about educational strategies and instructional practice to improve student achievement (Childress, Elmore, & Grossman, 2006; MacIver & Farley, 2003). Centralized business operations, such as capital expenditure and financing, facilities management, transportation and food services, and technology and information services, are necessary components of providing quality education (Odden & Busch, 1998). Administrative services, including

superintendent and school board oversight as well as human capital support functions, are also key support structures provided by central office personnel (Berne et al., 1995; MacIver & Farley, 2003).

Specifically, in terms of central office responsibilities that positively affect student achievement, MacIver and Farley (2003) found that central office personnel provide this support by advising on good curriculum and instructional practice, recruiting and equipping principals and teachers to work within the district culture, helping school staff to analyze data and decide what instructional changes need to be made, and providing administrative support so that good instruction can occur.

Campuses and school districts in today's data-driven and high-accountability era face many key issues in order to promote student success. Important factors such as increasing diversity, school financing, student mobility, and assessment and accountability all lead to the complex nature of modern-day education and leadership (Glass, Bjork, & Brunner, 2000). However, the redefined role of the central office, comprehensive school reform models, and a constant focus on data-informed decision making help to reframe the complexities with a focus on total student achievement.

Central Office Data Use

The central office has been suggested as playing a major role in creating the appropriate culture and supports for engaging in data use to aid in decision making (Boudett et al., 2005; Coburn et al., in press b; Corcoran et al., 2001; Datnow et al., 2007; Honig & Coburn, 2008; Wayman et al., 2007). Recent studies of central office

data use are few; however, sourced from the research are key learnings that provide evidence about how central office administrators use data to inform decision making.

The body of research reviewed by Coburn, Honig and Stein (in press) indicated that the use of data by central office personnel to make decisions occurs far more frequently than typically thought. Data users at the central office also exhibit a wider variety of use than at the school level (Wayman et al., 2007). Furthermore, some high-performing districts put processes in place at the central office level to make an effort to have decisions made based on data rather than on instinct (Datnow et al., 2007; Marsh, 2000; Skrla et al., 2000) and show a commitment to data-driven decision making and instruction by providing assessment data to staff along with training for its use (Skrla et al., 2000; Snipes et al, 2002).

Datnow et al. (2007) examined the data practices of four school systems and found six key strategies that defined how high-performing school systems, including a strong central office providing targeted direction and support, use data to improve instruction for elementary school students: (a) building a foundation for data-driven decision making, (b) establishing a culture of data use and continuous improvement, (c) investing in an information management system, (d) selecting the right data, (e) building school capacity for decision making, and (f) analyzing and acting on data to improve performance. Boudett et al. (2005) noted the same basic premises in their step-by-step guide for using data and information to improve teaching and learning. Boudett et al. proposed eight key components of improving teaching and learning using data: (a) organizing at the district, campus, and team levels for collaborative

work; (b) building the assessment literacy of all stakeholders; (c) creating a data overview to provide focus for inquiry; (d) actually collecting and looking at the data down to the student level; (e) examining instruction and how it relates to the collected data; (f) developing an action plan based on the information collected; (g) creating a plan to assess progress including additional data to be collected; and (h) implementing the action plan and following through with the evaluation and assessment protocol.

Though both the Datnow et al. (2007) and Boudett et al. (2005) research looked into system-wide data use, Wayman et al. (2007) found in one district that data use at the central office level revolved predominantly around providing support to schools. Personnel at the central office gathered and disseminated data to schools regarding individual student trends as well as aggregated campus trends (Wayman et al., 2007). They also provided information to help with school improvement plans and more individual teacher support. Other data uses included providing supports to district operational functions, including targeted data collection and analysis of student demographic data for transportation services, of teacher and student demographic data for human resources to determine personnel trends and needs, and of historical data for the community relations department to provide a variety of information in diverse media for outside stakeholder groups (Wayman et al., 2007).

Coburn et al. (in press a) researched the many ways central office administrators use data and evidence in the decision-making process. Through their review of literature they found that the process for evidence use in decision making is

complex, and they argued that building capacity within the system and taking deliberate steps to support decision making based on relevant information is the only way to sustain a culture of evidence use for decision making. However, they suggested four key strategies to support the use of evidence while building this capacity:

1. Collaborating with external organizations supports access to relevant evidence and can facilitate the decision making process.
2. Central office administrators assessing the current structures or processes in place that support evidence use and ascertaining additional areas of funding that would provide resources to aid in the decision-making process.
3. Fostering conditions for collaboration so that collective interpretation is possible, instead of narrowing the field of who makes decisions, is critical for central office administrators to consider.
4. Finally, building political support, both within the educational systems and externally, for evidence use is essential for central office decision making, as politics is an inevitable component of decision making in public organizations such as schools.

Given these findings and recommendations for data use in central offices, it is still clear that limitations are present. Research has suggested that many districts are using data in a disjointed way (Wayman et al., 2007). Seven key limitations are most commonly found in the literature that prevents the integration of data use at the central office.

1. Time and resources that encourage the use of data are a concern. Users of data are not able to access the information they need in a simple and timely manner (Coburn et al., in press a; Corcoran et al., 2001; Datnow et al., 2007; Honig & Coburn, 2008; Johnson & Cheng, 2007; Reichardt, 2000; Wayman & Stringfield, 2006a; Wayman et al., 2007). Included in the resource constraints are a lack of personnel dedicated to working with, collecting, and training others about data. Time was the most common concern for data use, as it was found that many central office administrators felt the pressure to “do something” by stakeholders at all levels of the educational system and could not wait for program evaluation results or outside research before acting (Corcoran et al., 2001; Honig & Coburn, 2008).

2. Linked to the limitation of time and resources are the problems revolving around the search and incorporation of data into the decision-making process. Accessibility has already been noted as a concern, but the actual search for data and research is an integral part of the data use process. Availability of data, the premise that appropriate data is not always available, accessibility of data, the choice of what data to incorporate (or not incorporate) during the data use process, and the technology by which all of this occurs is yet another limitation to central office data use (Coburn et al., in press a; Datnow et al., 2007; Honig & Coburn, 2008; Wayman et al., 2007; Wayman, Stringfield, & Yakimowski, 2004).

3. Even when central office administrators are able to search and incorporate data into the decision-making process, another aspect of the data use process that hinders effective decision-making is the fact that data are ambiguous (Coburn &

Talbert, 2006; Coburn et al., in press a; Honig & Coburn, 2008). When data can be interpreted in many ways that are legitimate, administrators tasked with decision making struggle to gain consensus and often limit either data collection or the number of people involved in the decision-making process to facilitate the decision making.

4. When actual decision making does occur, many educators at the central office level rely on pre-existing beliefs and working knowledge of the context about which the decision is being made over the data that are presented (Coburn et al., in press a; Coburn et al., in press b; Corcoran et al., 2001; Ingram et al., 2004).

Personnel at the central office level who use data to make decisions consult and apply data that make personal sense to strong pre-existing beliefs instead of data that challenge thinking. In large part, this is due to the need to make sense swiftly of the abundance of data available at any given time.

5. Given this, central office administrators not only often use data to confirm or justify already established opinions, but also choose and employ data to make political arguments (Coburn et al., in press b; Corcoran et al., 2001; Honig & Coburn, 2008). At times, central office administrators carefully use data to make more robust arguments to school boards and community partners in order to garner support for reform strategies (Corcoran et al., 2001).

6. Further, two limitations refer specifically to the instructional aspect of data use, including the lack of congruence from stakeholders about what constitutes “good” instruction and data to reflect that instruction and the lack of content-knowledge experts involved in decision making (Coburn et al., in press b; Corcoran et

al., 2001). Coburn et al., (in press b) noted frequent debates about what constituted “good” instruction at the central office and thus what represented valid data that represented that instruction, a central reason as to why calibration is important (Wayman et al., 2006). This confusion resulted in participants involved in the decision making narrowing the voices involved, structurally elaborating the policies that were founded, or using authority figures to select a solution or make the final decision.

7. This finding led to Coburn et al.’s (in press b) argument that there is a need within the central office to broaden opportunities for individuals from a variety of divisions to interact. Beyond this, expanding those within the decision-making structure to include educators with core content knowledge was imperative, as those with the most content knowledge to expound on the data presented and to create viable suggestions for improvements are often not the same as those with decision-making ability.

These seven hindrances of effective data use at the central office level provide helpful focus for central office administrators but also add credence to the reform movement and the assertion that central office administrators are critical to data use at all levels. Each of these limitations can be addressed by thoughtful central office administrators creating specific concrete strategies to show the dedicated importance of continuous data use and by creating a data-informed culture that acknowledges the personal biases each person brings to the decision-making process. Further, the best practices, elaborated previously, provide a beginning foundation of knowledge about

central office data use. However, there are still gaps in our knowledge about how central office staff use data and what central office administrators do with data to support instructional quality and student achievement. The current study aims to illuminate reasons why there are hindrances that affect data use and how district central offices may use data to focus on improved instruction and student progress.

CHAPTER 3: METHODOLOGY AND PROCEDURES

Introduction

The purpose of this study was to better understand how central office administrators may use data to support educational growth. The study focused on the following two research questions:

1. How do central office personnel involved in curriculum and instruction use data to support district goals of improved student achievement?
2. How do central office personnel involved in curriculum and instruction use data to support campus goals of improved student achievement?

The purpose of this chapter is to discuss specific methodologies and procedures used in the study to answer both research questions. Detailed information is provided about relevant case study literature, the research methodology, participants, method of both quantitative and qualitative research, data collection procedures, and the final data analysis process.

It is important to note here that this study is a secondary analysis of data previously collected (Wayman et al., 2007). The data were originally gathered as part of an evaluation report directly provided to the school district in order to present direct feedback and targeted strategies to improve data use at every level and to establish a data-informed district culture.

Natrona County School District

Setting

This study focused on a school system in Wyoming. The Natrona County School District (NCSD) is located in central Wyoming and encompasses over 5,300 square miles. In terms of area, Wyoming is the 9th largest state and the 51st largest state (including the District of Columbia) in terms of population (U.S. Census Bureau, 2008). There are 24 counties in Wyoming and 48 school districts (Wyoming Department of Education, 2008). Many of Wyoming's districts are small and rural; however, NCSD is the second largest by population (Wyoming Department of Education, 2008). NCSD's 38 campuses serve approximately 12,000 K–12 students and employ about 850 teachers. The total number of employees, including staff dedicated to business, operations, curriculum, administration, and support services, is 1,900.

Demographics

The student populations in Wyoming can be characterized as fairly homogenous. Specifically, the NCSD student population is 89% White, 7% Hispanic, 2% African American, 1% Asian American, and 1% American Indian or Alaskan Native. NCSD had a 72% graduation rate for the 2007–2008 school year (Wyoming Department of Education, 2008). Overall, Wyoming has the second largest percentage of high school graduates over the age of 25, compared to all of the 50 states (U.S. Census Bureau, 2008).

Within the district, the English language learner population increased dramatically over the last 5 years. In the 2002–2003 school year, English language learners comprised merely 0.2% ($n = 29$) of the population. In the 2007–2008 school year, English language learners had increased to 2.1% ($n = 248$) of the population. During that same time period, the total student population grew by only 133 students, with a total enrollment in 2007–2008 of 12,040. During this same time period, according to an internal NCSD document, district-wide enrollment in the free and reduced-price lunch program increased from 30.8% ($n = 3,666$) to 33.5% ($n = 4,033$).

District Organization

The district is composed of 26 elementary schools, 3 middle schools, 3 junior high schools, 1 academy that serves Grades 6–9, 1 junior and high school composite, 3 high schools and 1 half-day alternative education center. The district is governed by nine members of the board of trustees who work with the superintendent. These members are elected to staggered 4-year terms by those that reside in the district and are elected at-large during school elections held biannually in November.

In terms of central office organization, the main office is separated into four divisions: (a) curriculum and instruction, (b) business, (c) facilities, and (d) technology, and human resources. The Curriculum and Instruction Department is the largest of NCSD's four divisions. According to the district Web site, the Curriculum and Instruction Department “oversees the teaching and learning in the district, from assessments and curriculum to educational grants and student safety” (Natrona County Schools, n.d., ¶ 1). Specifically, the department is broken up into various

offices, including assessment and research, athletics, career and technical education, educational technology, special education services, student support and safe schools, student wellness, and transition services.

NCS D states that it is a district of choice. In a 2008 internal memo to the board of trustees and the superintendent, a school of choice is defined as one that allows parents and students to choose to attend any public school in the district. The district uses the term *district of choice* interchangeably with the term *open enrollment*. There is an online open enrollment form that all parents and guardians must fill out each January in order to request a school that is not a primary neighborhood school.

District Academic Achievement Scores

In 1995, the Wyoming Supreme Court issued a mandate to the state to create an assessment system for public schools. In 1997, the Wyoming Department of Education adopted the Wyoming Language Arts and Mathematics Standards and, in 1999, the state first administered the Wyoming Comprehensive Assessment System. With the passage of NCLB in early 2002, the state reviewed and revised its documents and adopted new standards in 2003. Between 2004 and 2005, the math and language arts assessments were developed and called the PAWS. In May 2005, the PAWS was first field tested, with results of the first administration released in 2006 (Wyoming Department of Education, 2008). The reporting structure for PAWS allows students to achieve scores of Below Basic, Basic, Proficient, and Advanced. Data from the 2008 PAWS are reported in the figure.

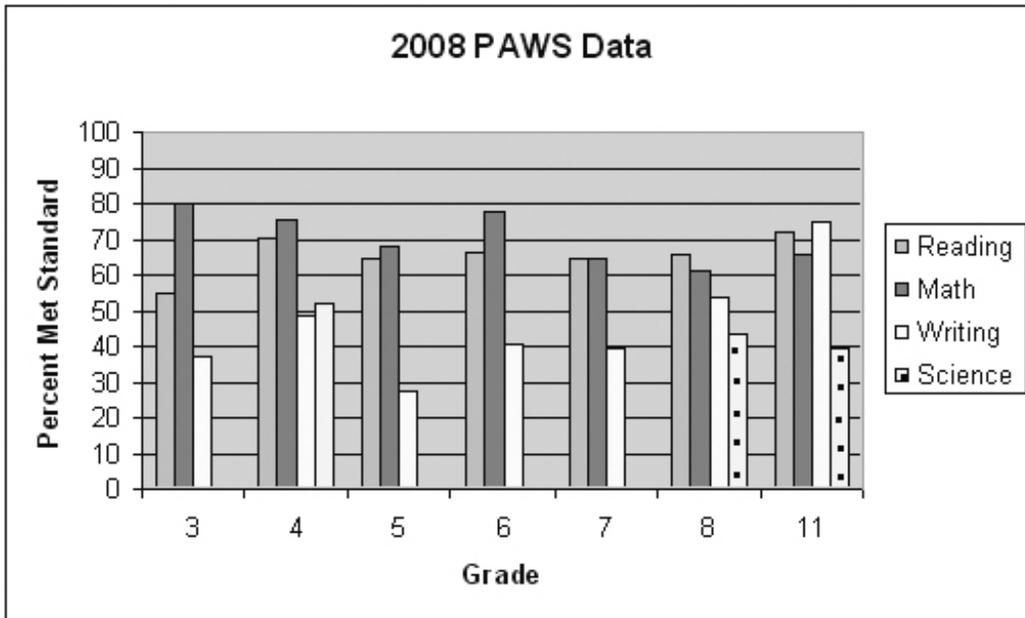


Figure. Proficiency assessments for Wyoming Students (PAWS) statewide data for 2008.

Academic Yearly Progress (AYP) as reported through federal guidelines of NCLB were not met for numerous indicators in NCSD in 2008. The indicators found under the AYP rating system include student assessment results for reading and language arts and for mathematics. Graduation rates and the percentage of students participating in assessment rates are also included as indicators. According to the Wyoming AYP press releases for 2006–2007 and 2007–2008, NCSD schools did not meet AYP for a number of indicators and was received district-improvement status during the 2008–2009 school year (see Appendix A). Along with the district being placed on district improvement, a number of individual schools failed to meet AYP but were not placed in school improvement (see Appendix A for a complete list).

Recent District Data Initiatives

As a state, Wyoming has taken recent steps to improve data use capability. Policy is in place to support data-driven decision making, the state assessment system is set up to provide specific data to districts and schools, and the yearly accreditation process revolves around specific data competencies (Reichardt, 2000). The Wyoming Department of Education (2008) utilizes the Wyoming Integrated Statewide Education Data System, which connects a variety of software programs within school districts to the department of education. The Wyoming Integrated Statewide Education Data System allows for the simple transference of data required by Wyoming Department of Education and shares educational data among the state, districts, and schools. Furthermore, the PAWS assesses students in reading, writing, math, and science at Grades 3–8 and 11 (Wyoming Department of Education, 2008).

NCSD was placed under district improvement provisions of NCLB in 2008 due to 2 consecutive years of not meeting AYP. Specifically, the district did not meet targets set for students who have individual education plans at the elementary, middle, and secondary levels. Further, two of the three high schools did not make AYP on an additional indicator for graduation rates, and many schools were noted for poor performance on the language arts portion of the state assessment. NCSD was the only district in Wyoming to be placed under district improvement provisions based on 2007–2008 results (see Appendix B).

In an effort to comply with federal regulations and place a concerted focus on improvement, a district improvement team was convened to create a district

improvement plan. It is important to note that because of the complete decentralization of the district and a commitment to site-based management, no district improvement plan or future-focused document to guide decision making at the district level had been in place (Flicek, 2008).

In order to create the district improvement plan, committee members first agreed that data needed to be considered from both the proficiency assessment for Wyoming students (PAWS) and the growth assessment model used by the NWEA, called the Measurement of Academic Progress. Each of the elementary, middle, and junior high schools within the NCSD system was reviewed, with data provided for status indicators, improvement indicators, and growth indicators. Appropriate assessments were used for each measure. Flicek (2008) explained,

As data were reviewed by each committee, areas of excellence were identified along with areas of underperformance. The level of district involvement in the terms of providing resources, support, or professional development opportunities should be much greater in areas of underperformance. Where there was excellence, a “hands off” approach by the central office seemed to make sense. These initial district level reviews of data that occurred ... concluded that underperformance was evident for the subgroups of students on free/reduced lunch and those on individual education plans (IEPs). Students in these groups had lower initial achievement levels and they were growing less over time, indicating that they were falling further behind the longer that they were in school. (p. 1)

Once the data were compiled for all campuses, each school was provided a rating of Focus, Unclassified, or Excelling (Flicek, 2008). Focus schools were defined as those underperforming for the criteria. Excelling schools demonstrated clear success with the entire student population of the school. All schools were first designated as Unclassified, and through the process were either moved into Focus or

Excelling. A few were left with the Unclassified rating. The main purpose of the categorizations was to provide a framework with which central office could work to move forward with district improvement processes and afford targeted resources and support to the most needed aspects of student instruction on campuses labeled as Focus schools.

Upon completion of this process, three goals were set to improve state assessment scores: (a) goal setting at all levels of the organization, (b) a focus on the Six Traits writing model¹, and (c) the creation of a guaranteed and viable curriculum (Flicek, 2008). Simultaneously, there was a movement in the Curriculum and Instruction Department and Assessment and Research Office to provide multiple disciplinary supports to campuses in an effort to move them from Focus to Unclassified or Excelling, which continued to be based on the data collected for the initial classification process. This support was applied in a number of ways, according to Flicek. Central office directors and coordinators routinely met to align responses to campuses most in need, and direct assistance was provided to the principal at each campus. A central office administrator joined the principal at each campus meeting to help staff understand the process and data used to support identifying the campus as a Focus school. Also, a school improvement planning session was held for the district where teams from each Focus school were invited and engaged in activities

¹ Six Traits Writing Model, or 6 + 1 Trait Writing, is a writing process including instruction and assessment frameworks created by the Northwest Regional Educational Laboratory

surrounding continuous improvement processes dedicated to data analysis and inquiry.

Research Design

A mixed methodology of qualitative and quantitative research methods approach was used for this study. As Miles and Huberman (1994) explained, “Numbers and words are *both* needed if we are to understand the world” (p. 40). The two forms of data, once viewed as antagonistic, are now linked in such a way that a mixed-methods approach is accepted by the greater research field and thought to be complementary and informative (Miles & Huberman, 1994; Teddlie & Tashakkori, 1998; Thomas, 2003).

Teddlie and Tashakkori (1998) stated that a mixed-methods design includes both qualitative features and quantitative features in the design, data collection, and analysis process. Furthermore, the purpose of the mixed-methods approach is to provide complementary detail in the answers to the research questions. For this particular research study, the pragmatic-parallel, mixed-methods design is used. The pragmatic-parallel, mixed-methods design is characterized by using both data analysis results to make final inferences; the two types of data are collected independently at the same time (Mertens, 2005). To this end, both the quantitative and qualitative data collection tools were used to balance each other, not with the foresight that one would dominate the other. Thomas (2003) explained that the best answers to research questions frequently result from the use of both qualitative and quantitative methods.

As such, each method is suited to provide different insights to each of the research questions, thereby allowing for a more robust analysis.

Quantitative Data Collection

The quantitative data collection tool for this study was a survey created for the larger study (Wayman et al., 2007). Data collection choices must be considered when conducting survey research (Mertens, 2005). Mail, telephone, e-mail, or online surveys are common options used as a method of collecting data and all have advantages and disadvantages. In order to be efficient, cost effective, and equitable to all NCSD employees, the survey was developed and administered online. All employees who utilize data as part of their job with NCSD were offered the opportunity to participate in the survey, and as such no purposeful sampling other than that was considered.

The survey invitation was sent via e-mail to the employees and directed them to the online tool. The survey was open for a week. A follow-up e-mail was sent to all personnel not responding to the survey within 3 days.

The survey consisted of three distinct parts: (a) a demographic section, (b) Use and Perceptions of Educational Data Survey (Wayman & Supovitz, 2007), and (c) School Culture Quality Survey (Borman & Associates, 2005). There were 85 total questions, and items from the first and second sections were used for this research. Participants were not allowed to leave any items blank.

For demographic information, the survey asked participants to provide information about length of service as an educator, length of service with NCSD

specifically, and employed position. Teachers were asked to provide the name of the building in which they teach, but to provide additional anonymity other educators assigned to specific buildings were not.

The second part of the survey, the Use and Perceptions of Educational Data Survey (Wayman & Supovitz, 2007), provided participants with 45 questions revolving around attitudes toward data use, perceptions of district data quality, computer systems for accessing data, district plans for linking data and learning, district supports for data, and specific ways that data are used. Two open-ended questions were also available for participants to provide additional information about alternative systems used as well as ideal situations of additional data that would improve the quality of their work. Each question was set on a 4-point Likert scale with response categories appropriate to the nature of the question (e.g., *strongly disagree, somewhat disagree, somewhat agree, strongly agree*). Detailed information regarding the scales used for this study is described below. This particular section of the survey's psychometric characteristics has been reported by Wayman et al. (2007).

Responses to the online survey were collected from 435 participants for the original study and responses from teachers, principals and instructional facilitators were included in the present research. Responders were instructed to select one of eight educational roles that most closely resembled their current position in the district: (a) central office staff, (b) principals, (c) assistant principals, (d) school counselors, (e) instructional facilitators, (f) teachers, (g) school support staff, and (h) other district support roles. School support staff, assistant principals, school

counselors, and participants who designated themselves as in other roles were not included in the present study. It is important to note that central office staff were not included in the present study either, as the designation did not differentiate between central office workers in general and those who work directly with curriculum and instruction in some way, resulting in the data available not being aligned with the research question.

For the present study, a subset of survey items was examined, including one scale and two additional items in order to provide additional information to answer Research Question 2. To create the scale, responses for all of the items were added together and then divided by the number of items in the scale, so that the average response per item was reported. The District Data Quality scale was analyzed for this research as well as two questions regarding the professional development and preparation of individuals to use data. The respondents who were part of the analysis included principals ($n = 16$), teachers ($n = 278$), and instructional facilitators ($n = 12$).

The District Data Quality scale consisted of five items that asked the extent to which participants agree to the following statements:

1. The data provided by my district are accurate and reliable.
2. The data provided by my district are useful to me.
3. The data provided by my district offer timely information on students.
4. The data provided by my district inform how I teach students.
5. The data provided by my district give me different information about student learning than I already know.

The alpha reliability for this scale was .805. Two additional survey items were analyzed: (a) My district provides useful professional development opportunities to help me learn more about how to use data, and (b) I am adequately prepared to use data.

Qualitative Data Collection

Quantitative and qualitative methodologies can have a symbiotic relationship, but there are distinct differences. Quantitative research examines component parts of a phenomenon breaking things down to the individual level, whereas qualitative research uncovers how each section works together to form the whole (Merriam, 1998). According to Merriam, qualitative inquiry begins with the primary belief that “meaning is socially constructed by individuals in interaction with their world” (p. 6). In essence, each person constructs and interprets reality and meaning in his or her own way, and the qualitative researcher should be interested in understanding this constructed meaning. Towards this end, qualitative research has unique characteristics including the following:

1. Qualitative research seeks to understand the meaning people have constructed about their world and experiences (Merriam, 1998).
2. Data collection and analysis are done through the lens of the researcher (Lincoln & Guba, 1985; Merriam, 1998).
3. Qualitative research occurs in the natural setting; fieldwork must be involved (Lincoln & Guba, 1985; Merriam, 1998; Mertens, 2005).

4. Research focuses on inductive strategies that hope to explain the data with thematic findings (Merriam, 1998).

5. The end product is rich in its descriptive nature (Lincoln & Guba, 1985).

Because of the qualitative characteristics listed above, data collection for the qualitative researcher may take many forms including field notes, interviews, conversations, photographs, recordings, and memos, turning the observed world “into a series of representations” (Mertens, 2005, p. 256). For this study, a qualitative approach collecting data from group conversations and individual interviews is suitable. Two types of qualitative data collection formats were used to provide a comprehensive picture of data use. Interviews and focus groups were the strategies of choice for data collection.

Interview Procedure

The first means of collecting qualitative data for this research study was interviews. According to Patton (2002), the purpose of an interview is “to enter into the other person’s perspective ... to gather their stories” (p. 341). Denzin and Lincoln (1998) explained that interviews answer questions that ask about “how social experience is created and given meaning” (p. 8). The interviews conducted addressed issues related to how data were used and accessed in the district, specific data systems that were used by the interviewee, and ideas about how data use should be envisioned for the future. As recommended by Mertens (2005), a semi structured protocol was used when conducting the interviews (Appendix C).

Sampling for the interviews was two-fold. Representatives from both the central office and campus level participants were sought. Central office employees were identified for interview through a list naming the person and describing the position held. The list of people to interview was created and then discussed with the primary contact at the district from the Office of Assessment and Research to ensure coverage of all important central office functions. Furthermore, additional interviewees were identified by asking participants for recommendations of other key individuals at the central office level to interview. Campus-level interview participants were selected at random from a list of all campus employees who were teachers and principals and represented 22 schools across the district. The list was stratified into elementary, middle, and high school levels to allow for coverage of all levels and to ensure proportional representation of NCSD.

Focus Group Procedure

The second means of collecting qualitative data was focus groups. Mertens (2005) stated that focus group interactions can show how differences are resolved and consensus building. According to Mertens, the focus group is meant to be a “guided discussion” (p. 386) and allows for interactions between participants in such a way as to limit the dominance of the interviewer. The topics for discussion revolved around much of the same issues as the individual interviews did. A semi structured protocol was also employed for the focus groups (Appendix D).

Participants of the focus groups included members from outside stakeholders (e.g., parents, students, and teacher organizations), school leadership (principals,

assistant principals, and other leaders designated by the principal) and classroom teachers. There was careful determination of the characteristics of the focus groups, and for the purpose of this study consistent groupings of the three types described above were used in the composition of each group. Participants in the outside stakeholder focus groups were recruited with the help of NCSD administration. Schools selected to be participants in the focus groups were chosen because they were representative of NCSD in terms of grade levels taught, socioeconomic status, and magnet curriculum.

Two focus groups were conducted at each school. The first focus group was the leadership group that consisted of the principal, assistant principals, or other faculty designated by the principal. The second focus group was composed of 3–5 teachers. Participants for the teacher focus groups were selected by the principal from a randomly generated list of 7–9 teachers.

In total, the qualitative sample included 119 interview or focus group participants and represented 22 schools. Of those 119 participants, 80 were building staff and 33 were central office personnel and 6 were parents.

Data Analysis

In order to make meaning out of the collected data, specific data analysis procedures are needed. Organizing the data into a practical framework to allow conclusions to be drawn is the purpose of clear and precise data analysis. This process becomes more complex when considering both quantitative and qualitative data that need to be engaged together in a case study. Stake (1995) reminded researchers that if

it is *the case* we are trying to understand, we analyze episodes or text materials with a sense of correspondence. We are trying to understand behavior, issues, and contexts with regard to our particular case. (p. 78)

For this study, the analysis combined the survey responses with the interviews and focus groups to provide for solid data analysis of NCSD. The comprehensive methodology of including both quantitative and qualitative data collection allowed for the possibility to represent every school within the district but three; every central office department; the entire administrative cabinet; and external stakeholders, including parents, students, board of trustees, and the local teacher association.

Analysis by Constant-Comparative Method

Merriam (1998) explained that for qualitative data analysis to occur, a recursive process must include a basic descriptive account of the data; category construction, including any notes, comments, or observations made by the researcher; comparing these categories as the transcription process continues; naming the categories; and creating a system for placing data into categories. The constant-comparative method was developed on the basic belief that the researcher constantly must compare when analyzing data. Glaser and Strauss (1967) are credited for developing the method. In order to constantly compare, Merriam (1998) stated,

The researcher begins with a particular incident from an interview, field notes, or document and compares it with another incident in the same set of data or in another set. These comparisons lead to tentative categories that are then compared to each other and to other instances. Comparisons are constantly made within and between levels of conceptualization until a theory can be formulated. (p. 159)

The constant-comparative method is appropriate for this approach, as different categories are created that are appropriate when considering both the survey data and the qualitative data.

Steps for Overall Data Analysis

The constant-comparative method of analysis traditionally has three steps in the process: (a) open coding, (b) axial coding, and (c) selective coding (Mertens, 2005). Because both the quantitative and qualitative data are considered in a parallel nature, this type of coding is used; however, more steps are also needed in the analysis process. The following discusses the specific steps employed to analyze all data, understanding that this process is recursive, not linear, in nature.

1. Prepare the data for analysis. This includes all transcription as well as collecting field notes, relevant documents, and survey responses (Creswell, 2003; Mertens, 2005).

2. Read through all of the data, making notes about general ideas and impressions (Creswell, 2003; Merriam, 1998).

3. Organize the data by source, including, but not limited to, central office personnel, teachers, school administration, instructional facilitators, and so on (Creswell, 2003).

4. Create a document summary form for each interview and focus group (Miles & Huberman, 1994) as well as a survey data point. This summary form is addressed and updated each time codes are added.

5. Begin the open-coding process. Mertens (2005) explained that this specifically means “naming and categorizing phenomena through close examination of the data” (p. 424). Codes are given to these phenomena, beginning with a list of start codes (Miles & Huberman, 1994). For this study, these start codes are taken from Wayman et al. (2007). Repeat this process for each set of data. Keeping in mind the initial groupings from the original list, constant comparisons are made in the data about similarities and differences.

6. Add the codes with adjacent notes about the survey data and qualitative data to an ongoing memo (Merriam, 1998).

7. Once all data go through the open-coding process, identify patterns and relationships between the codes, looking for commonalities and differences. Mertens (2005) described as part of this coding the researcher should “continue to ask questions of the data; however, now the questions focus on relationships between the categories ... and begin to formulate possible relationships and... search the data for verification or negation of the hypothesized relationships” (p. 424).

8. Once patterns and relationships have been established, place these patterns and relationships into categories. Merriam (1998) pointed out, “Categories are abstractions derived from the data, not the data themselves” (p. 181) and should reflect the purpose of the research, if not answer the research questions. Categories should be exhaustive, mutually exclusive, sensitizing, and conceptually congruent, according to Merriam.

9. Where patterns and relationships are found and placed into categories, these translate into possible explanations of findings to answer the research questions (Creswell, 2003; Merriam, 1998). During this final step, Lincoln and Guba (1985) explained, meaning is made or the lesson is learned.

Data Analysis Procedure

For this study, every effort was made to create the most complete picture of the school district. Strategic efforts to include every role and operation within the organization were made. Research Question 1 was the following: How do central office personnel involved in curriculum and instruction use data to support district goals of improved student achievement? To answer Research Question 1, interview data were studied to determine how central office staff working with curriculum and instruction, use data to support the key district goals of improving student achievement. Comments about overall district operations and the extent to which the personnel use data effectively to inform educational decisions and instructional programming and design were targeted for analysis. Specifically, the a priori themes for Research Question 1 included district vision, collaboration, technology and access to data, assessments, school-of-choice model, and community relationships. The final themes for Research Question 1 were the valuation of data, data reporting and community involvement.

Research Question 2 was the following: How do central office personnel involved in curriculum and instruction use data to support campus goals of improved student achievement? Research Question 2 was analyzed through the use of interview

and focus group data as well as data collected through the survey. Qualitative data were collected from both central office staff and campus-based personnel, including administrators, teachers, counselors, and instructional facilitators. Data were examined through the lens of specific supports provided directionally to campus sites from central office personnel to aid in teacher instruction and student achievement, the main purpose of campus activity. Attention was given to examples of support, such as providing targeted professional development, technology systems, or support in the form of raw data and reports and providing opportunities for collaboration surrounding data. Specifically, the a priori themes for Research Question 2 included district and campus vision, collaboration, technology and access to data, professional development, assessments, school-of-choice model, campus leadership data use, teacher data use, and goal setting. The resulting themes developed through analysis of Research Question 2 were professional development, data reporting and goal setting.

Quantitative data analyses were also conducted. A one-way analysis of variance (ANOVA) with effect sizes was completed for the two individual survey items. The results from the question sets were analyzed for principal, teacher, and instructional facilitator responses. The same process was used for the District Data Quality scale using the same respondents. When ANOVA indicated significant differences, Tukey's post hoc tests were conducted to identify significant pairwise differences. The quantitative data analyses were used to triangulate the qualitative data responses about data use and support.

CHAPTER 4:

RESULTS

Introduction to Results

The purpose of this study was to better understand how central office personnel involved in the Curriculum and Instruction Department use data to improve student achievement. Specifically, the research questions asked how central office personnel involved in curriculum and instruction use data to support (a) district goals of improved student achievement and (b) campus goals to improve student achievement. The explanation of findings is presented thematically for each research question.

Results for Research Question 1

How do central office personnel involved in curriculum and instruction use data to support district goals of improved student achievement? This section presents the qualitative data findings from central office personnel, campus leadership, campus faculty, and parents. The three themes presented are (a) valuation of data, (b) data reporting, and (c) community involvement.

In summary, it was found that the Curriculum and Instruction Department had three specific responsibilities in the drive to improve student achievement: (a) The message had to come across to all stakeholders that NCSd as a district values all types of data; (b) data reports were a large output function of the central office due to the requirements and regulations put forth by the district itself, the state codes, and federal guidelines; and (c) the Curriculum and Instruction Department garnered

community involvement in the data process and educated all stakeholders about data use.

Valuation of the Data

An important revelation for NCSd central office administrators was the existence of a public relations issue with regards to assessment and demographic data. The administrators revealed that this issue emerged both within the teaching ranks and the greater community and had a primary root cause in the school-of-choice model. When contemplating how to work with data as a whole, central office staff realized that sending a clear message validating formalized assessment data was an important step in data use and that sending the clear message was one way to support increased student achievement. This message of validating the collected and reported assessment data is the definition of the theme of the valuation of data. Basically, the value individuals place on data needed to be increased for both internal and external stakeholders so that decisions based on data to improve student achievement could be seen as a goal.

The interviews revealed that some teachers questioned the validity of the assessment data, and there was a need for the district to have a common voice in valuing the data collected. Many comments from teachers and some principals indicated common defenses used when thinking about data. Included in these justifications were the disconnect between the state standards and what really should be taught and the lack of data available, as the state assessment is only longitudinally analyzed over 2 years because of the distinct changes made in both the curriculum

and the assessment tool. Teachers also defended actions and responses about data use by stating that low performance on tests was a result of student actions and external factors not controllable by teachers.

One teacher discredited the data and the district approach by suggesting that nothing was wrong with student achievement as it stands:

You know, sometimes it's sort of like, if it wasn't broken, why are we trying to fix it? And we're always hearing our scores are going down, our scores are going down, and we need to get them back up. Well, where are they coming down from? You know?

Another teacher questioned how appropriate it was for the district to compare educators with data, providing the reason that not all children can learn at the same rate and should not be held to the same proficiency standard. The teacher also wondered during the interview about the negative effect and hurt feelings of teachers when engaging in data analysis:

I guess my question for data though is sometimes it seems to me as a staff and as a district that we are comparing an apple to an orange. For instance, [another teacher] and I have extremely different populations in our classes, so while it may be interesting to see the difference in the number of Fs that I have versus the difference in the number of Fs [the other teacher] has, I don't know that that's very helpful to me as a classroom teacher because I'm not. ... We're not comparing an apple to an apple. We're comparing an apple to an orange.

A principal suggested that students existing knowledge is a concern and that cross-comparisons with other schools was not a valid strategy, yet did not discuss the ability to close the achievement gap or that all students should be achieving at grade level:

They come in with less. And you know we have little kids that come from homes and places where they have not done anything for school. We have little kids in kindergarten this year who do not know how to hold a pencil, and we're going to go against the schools who have the wonderful mothers who work with their kids and their preschoolers are ready to read. How's that equitable? So I'm not convinced that how we look at data needs to be even across the board. There's got to be a way to factor in the fact that we have some kids who are coming in way below.

Further, a principal acknowledged the difficulty with having a data focus and his acceptance of a common rationalization of why children have low test scores:

You know, I actually do more talking about what the data is talking about now, and I think I am in new territory on it. How do you have those conversations, because people will invariably say, "Well, it was a bad day for Jane and Jill and they didn't test very well." And I know that that can happen. I totally agree with that.

A complication of the school-of-choice philosophy is that it lends itself to increased mobility with students, because they are able to openly transfer at will. Additionally, each school is able to choose its own curriculum, leading to a lack of cohesion among schools. The transferring of students, and thus the decision about which students will count towards which campuses scores, is an ongoing issue of concern for teachers. One teacher noted the mobility factor as a reason campus-based staff did not find data applicable:

That's not fair to our building as a whole, either, because, I mean, we're analyzing and looking at PAWS data and whose scores are going to count towards our school and whose aren't, because they moved in after this date or they've never been anywhere too long so can we say that, you know, yeah, this kid made great scores, well, can you say it's because they've been here 3 months and been part of our intervention or because what was done at the other school? So really is the data telling us what we really need to know?

Common statements from teachers also included questioning how scores are given for the PAWS and the decision at the state level about what is tested, resulting in complaints about the validity of low-performing scores on the state assessment. One central office administrator put it succinctly when he commented about the low performance results reported on the state assessment:

We've had a culture of not valuing external assessments, and this year we've drawn a lot of attention within the district to the fact that our assessment results were not good. [We] made it very well known within the district at the school-board level. And, we're trying to get our community to begin valuing the results of the tests and not minimizing their value. [We are] trying to really accept that we are underperforming in many ways and that we need to do better.

Another district administrator stated,

Part of the issues around [our low test scores has] been a reluctance to really embrace state assessment, part of it has been a misalignment of curriculum. So those are issues we've working pretty seriously on. I think we're turning the corner on the attitudinal pieces. We're getting teachers to think that maybe this test really is measuring something valuable, that we really do want our kids to do well on it and that we don't just have a bad attitude about it.

As stated previously, in Wyoming, the PAWS designates results for students in four possible levels for the reading, writing, math, and science examinations:

Below Basic and Basic are not meeting the standard and Proficient and Advanced do meet the standard. The Measurement of Academic Progress has three designations: Below Expectation, At Expectation, or Above Expectation in reading, mathematics and language arts. As reported in chapter 3, many schools had high percentages of students who did not meet expectations on the PAWS, resulting in a backlash against the state assessment instead of embracing a culture of inquiry and digging into the

tough questions of why students did not meet expectations. For the first time, this information is now being made public on the local newspaper Web site for parents to view. One participant observed, “Where schools are really struggling with this is the idea that this is information for parents and it’s going to say that their school is Below Expectation in student growth. So, that’s a pretty big thing that is happening.” This participant also stated, “They all think that they are high-quality schools. But, in fact, they are underperforming. And, I think coming to terms with that is necessary for us to move forward and start making some progress.” Until campus staff are able to value the results of the state assessment and see them as a valid starting point for deep reflection, discussion, and collaboration about how to make improvements, any data initiative will be thwarted.

Central office also must be aware of parent perspectives on data. During a focus group interview of parents, one stated the importance of positive data over negative data:

It seems to me that again, focusing on which data is important. And I think the positive data is more important than the negative, and focusing on the successes and solutions instead of the problems is a much better use of data than what we tend to do, which is focus on problems.

Again, outside stakeholders along with teachers and principals come to data wanting mainly to see the “positive” outcomes instead of understanding that celebrating successes and continuously improving are able to go hand in hand.

The lack of valuation of data is rooted partly in the school-of-choice model. In essence, not only was there no venue for discussing standardized test scores or a

framework for addressing improvement projects for a number of years, but also the decentralization of NCSD became so complete, some schools did not even use common grading data consistent across the district. A campus principal explained,

Probably about 7 years ago ... the district went to being a school-of-choice district. The general approach was find a program that you feel is going to work for your school, with buy-in in for the community of your school. And each school then started becoming more unique from each other without a mandated district reading program throughout the district or anything like that. So, when that started happening, plus the move towards the school improvement process, then each school looked at their own data for that school and the student population.

Another principal stated, “We do standard-based grading. We don’t use letter grades at all ... back to the starting everything new. So we totally grade on the standards and give them ratings of the Advanced Proficient, Proficient, Basic, and Below Basic.” When prompted to address how the grading of students with this criteria in a high-mobility district was received, the principal responded, “You know what, our response to that is what does a B mean? I’ve been familiar with it, but that B doesn’t tell me any more than that P does, really.”

Central office staff acknowledged that school personnel and community members are not fully aware of the impact of state standardized assessments and how they can be used best to inform instruction and improve student achievement. Acknowledging this was an issue, while still moving forward with data initiatives, was important for them. Validating the data and creating a culture of inquiry was a maintaining focus. One central office administrator stated,

You have these schools and the reports may say Below Expectation for growth in reading, math, and language usage 3 years in a row. People don’t

want to accept that that's the reality. And, so we're trying to create a culture where we don't view bad assessment results as necessarily a negative. It's information that's actionable, we're not there yet.

Beyond that, the superintendent acknowledged the following:

I think pockets are starting to use [data] more and more and becoming much more willing to engage in discussions based upon data. I think the idea that the tests must be wrong because it's not telling me what I want to hear, I'm hearing less of that. I do hear that we don't measure everything we think is important, and I think that's very true. But I do think we are becoming much more open to discussing it.

The valuation of the data and creating the forum to allow discussions about student achievement based on data are very much intertwined. Within Research Question 2, qualitative data will be presented to show how the central office configured the goal-setting process.

Data Reporting

A fundamental way that central office uses data to support student achievement throughout the district is data reporting. In NCSD, the office of Research and Assessment is housed within the Curriculum and Instruction Department. As such, a part of the department's resources is dedicated to reporting for both state and federal compliance as well as to creating individual reports for intradepartmental needs.

The district would not receive state and federal data if the office did not provide information to educational entities regarding student enrollment, demographics, teacher assignment, and so on. The person responsible for many of the reports stated, "Basically, [our department] provides access to data in terms of

formulating queries and producing reports for people.” With regards to state and federal compliance reports, she noted,

They will ask either, “Can you give me the same thing you gave me last year concerning these parameters” and in many cases, “I’ve got a new requirement,” particularly in terms of federal and state and public reporting. “I’ve got a new requirement. Can you get it in a report that I can manipulate?”

Beyond those reports, the individualized requests for reports come from a multitude of departments:

Then we get, for example, somebody comes in and they are the [English language learners], English as a second language representative, and they say, “We need to get a list of everybody who is registered as English as a second language.” So we have those kinds of ad hoc services we perform.

Additionally, central office staff and administrators discussed the use of special education data and data systems and how reporting structures were created within that department for external use at the state and federal levels.

It is important to note here an emergent barrier to the data reporting in which the district engaged. That is, a distinct subtheme of data reporting was so often referred to that it became an integral part of the way central office uses data. The subtheme of data silos is presented here.

Referred to as “possessive of their own data,” “someone else is keeper of the keys,” and even, “a big, giant sucking vacuum cleaner,” central office personnel involved with curriculum and instruction often identified the “data silo” as a barrier to accomplishing work. For the purpose of this research, data silos can be defined as data kept in restrictive ways that do not allow for easy dissemination or collaboration. The data silo trend occurs in NCSD because of the lack of a data warehousing

system; transferring data is difficult, and organizational structures do not provide personnel easy access to those who create or house the data. One central office administrator indicated:

I think that's probably what's happening is that everyone has their own need for data so they create their own system. That's what is pretty obvious to us. And, I'm the same way. I've got my system that works for me, don't mess with it, you know?

Further, a central office administrator working in the technology department and not necessarily involved daily in curriculum and instruction explained how data silos prohibit sharing important data that may be useful to others:

I think all of us up here at central office have encountered situations where one person or group has built their own little system that supports something, and it really wasn't really convenient or practical to try to share it. I think it's frustrated a lot of us that have to recreate lumps of data each time we want to look at it.

Data silos are a barrier to sharing data and information, thus impinging on central office ability to complete data reporting that supports the district goals of improved student achievement. A key example of this is the inability of curriculum and instruction administrators to work with teachers on data-informed curricular decisions because of lack of access to data:

One of the huge pieces of data that we need to interact with that we've had difficulty accessing is from what we call our Body of Evidence, which are common assessments across different courses in the district. Teachers score these on rubrics and record the rubrics in Pinnacle and then we take them and put them in a DDR or DDA [district data analyzer], I am not sure which one. And we can't get them out of there after that. That's one of the things. I've worked with the teachers on the administering end and on the scoring end, but I haven't been able to look at the results so that we could actually start talking about changes in instruction that are necessary.

Another example of how data silos affect campus work is reflected in the secondary school assessment program. One instructional facilitator pointed out that the high school campuses were giving assessments and turning them in to the central office. At that point, she noted, “Right now that database can’t talk to anything else and we cannot get that information back. We’re sending the data to central office and the teachers are not seeing a connection.”

When sharing of data does occur, the requests for data and reports usually filter down to a handful of people, creating a bottleneck situation:

I do feel there are some bottlenecks. This stuff changes so quickly that as soon as we get one idea flushed out, either the software’s changed or the ideas have changed or the person has left and we have a new person that has to learn from scratch how to use that database. There are reports I’m waiting for that I conceptualized 2 years ago. I’m still waiting for them, and part of the reason is because it’s not technical work, it’s adaptive work. It requires people to think critically about how they might develop it instead of just go run it. I think we have a bottleneck in that area. We need more opportunity, more ability to share this adaptive work somehow. One of the struggles is you can’t do, you can’t even experiment with the concept, because you don’t have access to the data. There are other data keepers [who] are just in a situation where they’re the data keepers. You go to them and you get stuck in their queue.

Even with the massive constraint of data silos, data reporting is an integral way in which central office personnel involved in curriculum and instruction use data to support district goals of improved student achievement. Personnel create the reports in order to have data in a usable fashion but also provide data to entities outside of the district and receive data from those same entities in order to have a complete profile of information about NCSD.

Community Involvement

The third and final way that curriculum and instruction central office employees use data to support district goals of improved student achievement is through community involvement. Though it would seem that the Curriculum and Instruction Department of the central office would not necessarily be linked directly to community initiatives, in terms of reaching out to parents about student education, assessment scores, and opportunities to improve student achievement within the district, the Curriculum and Instruction Department is indeed involved. One central office administrator described a recent meeting:

We had a conversation in our curriculum and instruction meeting this morning about we have to educate parents because we may be very aware of the 21st-century field and how things are changing, but parents don't know and don't want us to change, so we have a huge deal. But we are trying to convince ourselves and others that it's appropriate for us to be on the forefront ... for us to shift the paradigm.

When parents were asked how they interact with data and how central office provides information, one noted improved communication with the community and with parents about key school achievement data:

The district has involved the media and the community and we have a young editor of the [newspaper] who is very involved in the community and has set up Web sites to get parental input on things, and even the district has gone so far is my understanding that we've hired our own media person.

When asked specifically what parents receive from the district about their own students' progress, another parent stated:

Every summer with the school report card they send out a copy of the PAWS or NWEA where our students have accumulated on the proficiency ... but it came in a separate envelope that was all testing information and never before had we gotten that. I think at the elementary level, the kids would get their

report card and they would put some sort of NWEA assessment in there, but they're making it much easier to have an envelope, and then you can sit down and process it.

Beyond this, the parents stated that the associate superintendent of curriculum and instruction has presented data about district goals and improved student achievement at the Parent Community Advisory Council. Parents stated that such a presentation is helpful given the complex nature of school achievement data:

I think [data] flies right over the heads of most of us because we're not statisticians and so although you get that and you look at it, you don't necessarily get all of it. I found it more valuable when you have someone like [the associate superintendent] go over it in one of our [Parent Community Advisory Council] meetings.

It was evident that community involvement with data is at the beginning stages. Central office personnel are aware that they need to engage the greater community, and parents are asking for more help with interpreting data. Parents at the focus group agreed that they would like more access to data and were concerned about the schools being transparent with testing results so that they could gain a complete picture of all the information regarding their school of choice and their children. Many parents agreed that they already use anecdotal information to assess the quality of the teachers in chosen schools when they get together at basketball games or other activities and that additional data would provide new information that may inform school-choice decisions. Additionally, the new editor of the local newspaper has created a Web site where parents and community members can access school and district information. The response of the district was to create their own community relations position to provide information to the greater community.

Results for Research Question 2

How do central office personnel involved in curriculum and instruction use data to support campus goals of improved student achievement? This section presents the qualitative data findings from both focus group interviews and personal interviews of personnel in the Department of Curriculum and Instruction at the central office level as well as campus leadership, campus faculty, and parents. Quantitative data results are also provided from the District Data Quality scale and two individual items concerned with professional development and preparedness to use data. The three qualitative themes presented are (a) professional development, (b) data reporting, and (c) goal setting.

In summary, it was found that the Curriculum and Instruction Department was responsible for three functions of assistance as it relates directly to providing support to campuses across the district: (a) Professional development about data use was provided to campuses, (b) the department generated and provided reports to campus faculty, and (c) curriculum and instruction administrators were a core part of establishing the goal-setting process for teachers and aiding the implementation of goal setting at the student level.

Professional Development

Professional development offered by central office staff to campus-based personnel about data use is one way curriculum and instruction personnel engage with campus faculty and staff to support campus goals of improved student achievement. Worth noting about professional development is the concept that formalized

professional development in NCSD is greatly influenced by the site-based, decision-making structure of the district, as the principal has the power to determine the budget appropriations and activities for professional development of campus staff and faculty. Another issue is a created side effect of the district not making AYP. When decentralization became complete in NCSD, one principal acknowledged this domino effect:

So professional development then started centering around each individual school's needs as opposed to a district-wide professional development. Professional development for a school is based on what research-based programs the school has chosen to address their needs. So the district basically pretty much bowed out of the professional development as the schools started doing their own thing, so to speak. Now the district is not making AYP. There is a big, and this will be the first year they're going at it, there is now a big switch back to district professional development to get schools that aren't making AYP. We have to have a district plan at this point, to put it bluntly. So that's again, the pendulum is swinging back. The district has to have professional development, but still at the same time, the school has to have professional development, too.

One teacher stated that more alignment of the professional development process would be helpful:

It would be nice for [professional development] to be coming from at least district level so that the teachers and the district are all looking at the data and the information in the same way and given some guidelines that are across the district, which would be really helpful.

However, district professional development for data use is becoming more commonplace than it has been traditionally. A result of the district improvement process is a concerted effort to make sure that professional development is ongoing and targeted to the areas most in need as measured by the state assessment test and the district data review committee. As one principal said, "The district is trying hard

to align their professional development to what is going to most affect those PAWS tests.”

Four distinct categories of professional development emerged in the data analysis: (a) professional development for principals, (b) professional development for instructional facilitators, (c) professional development for teachers, and (d) professional development results from the survey instrument. Each category focused to varying degrees on how to use data to support campus goals of student achievement.

Professional development for principals. Time and energy is focused on professional development for principals around data use and assessment analysis from the Curriculum and Instruction Department. However, the extent to which principals engage in these opportunities is dependent on the amount of interest the individual principal has in seeking them out and setting aside time. Consequently, principals take advantage of the development opportunities to varying degrees. As one principal noted, “In our administrative group, [there is] such a varying comfort level with the data. I think some schools use [professional development] better than others.”

Professional development for principals comes in a variety of formats. Numerous principals discussed one-on-one meetings with the Office of Research and Assessment to talk about school-specific data use, but this is a specific form of professional development that each participating principal sought out. Other principals talked about presentations at principal meetings and break-out sessions focused on ways to use data in the school.

Topics for these professional development opportunities were wide ranging. Most comments about direct professional development to principals were about how to read and interpret data provided by the district or how to access, read, and interpret data provided through the Internet on the NWEA Web site. Some professional development included “some introductions for, ‘Here’s how you could present it to your staff.’” There was no discussion during interviews about professional development that offered information about how to use the data to inform instructional decisions or design of lesson plans. Other opportunities included the director of assessment helping principals understand which skills needed to be taught in order to improve on certain data points on the standardized assessments as well as how to conduct snapshot observations to collect data about instructional choice and delivery.

Additionally, requests for more learning opportunities were frequently cited. Principals often stated that increased opportunities would be welcomed. One stated, “I would like more training.” Another said, “As a district I’d like to see them provide a little more training.” However, little evidence in the interviews indicated the specifics of what training would be most beneficial or that the principals were familiar enough with data to ask for specific and strategic professional development opportunities.

Professional development for instructional facilitators. The position of the instructional facilitator was newly implemented just over a year ago as a result of a massive influx of funding from the state as the state was experiencing a boom in the

funding source for education. Each campus has at least one instructional facilitator housed on the campus full time. The instructional facilitator is expected to provide direct and practical support for teachers in a multitude of ways, including instructional lesson planning and design, data collection and analysis, professional coaching, and assessment development. Most campuses have at least one instructional facilitator dedicated to math and one dedicated to reading.

The instructional facilitator model was utilized to better coach teachers with regards to lesson design and implementation (including modeling lessons) and data analysis that would inform instructional choices. One instructional facilitator leader described the position: “I support secondary teachers with instructional ideas, strategies, programs, and then ... we use the data to determine the strategies and then we look at the effect of them.”

Instructional facilitators are provided numerous opportunities for professional development and all have a data component. When asked about the professional development provided to instructional facilitators, the general response was that they were greatly supported by central office. Two-day district summits, one-day professional development seminars, and one-on-one coaching meetings with central office data experts are held regularly to support the instructional facilitators and develop data collection and analysis skills using district created rubrics and tools, as are monthly meetings at central office to share best practices about teacher support and data analysis.

Specifically with regard to data use and professional development from

central office, one instructional facilitator talked about her training in data use, illustrating an example of one-on-one coaching from the office of assessment:

A lot of what we do is looking at the kids' actual assessment data that we get, at the actual hard copies, kind of analyzing that together. I have assessment people sit down with me and we look that over, then we bring it in front of the staff. We look it over every fall when we first get all of our information. We all chart that. Everybody charts their goal for their kids and a stretched goal for their children.

Collaboration was also a common theme found throughout interviews with instructional facilitators. Some instructional facilitators noted that increased collaboration was a result of the monthly trainings that are provided by the district and some instructional facilitators are able to help with the design of the training:

I've been able to help even shape and mold some of the training pieces that come forward so right now we're contracted with a company called Spark Innovate. Spark Innovate works with results based coaching tools so actually putting in the hands of instructional facilitators [tools] that always look at student work and drawing conclusions.

Beyond the professional development opportunities provided by the central office, instructional facilitators had opportunities for development outside of the district. State conferences, both in Wyoming and other states such as Colorado, are commonly attended, with the expectation that learnings from those conferences are shared among other facilitators at common meetings. Professional readings and virtual book studies were also mentioned as part of ongoing development strategies.

Professional development for teachers. Professional development for teachers is greatly dependent on the principal. As with the principal professional development,

teacher professional development varies from campus to campus due to the school-of-choice model. One teacher explained,

I think [professional development] varies from building to building. Because they do have a good staff at the testing office, and if you invite them to come to your building and explain this or that, or to get on the computer and show teachers how to access information on their own, they will do that.

To a great extent, teacher professional development is derived from the professional development of the principal and the instructional facilitator designated to the campus and trickles down to the teacher. However, remarks from teachers indicated that professional development from central office was occurring increasingly and was beneficial to their teaching practice. One stated, “I think they [central office] are really trying. I think they’re also learning and I really do think they’re trying.” Another said, “We’re getting more and more [professional development].” Another noted that professional development “has so improved over these last few years.” Teachers who worked primarily with special education students noted that they received more training and development opportunities than did their general education counterparts.

When prompted to talk about how the district supports teachers and their use of data, teachers indicated that now that they have learned how to read data, they need more opportunities for additional professional development. One teacher stated,

Maybe some ideas and suggestions and actual examples of how to use that information to direct your instruction. Because I get a lot of information that even when I look at it and I know what it means, it still doesn’t drive my instruction like I would like it to, because I am not sure how to then plug it in to instruction.

Professional development information from quantitative data. Two individual items were considered to triangulate the qualitative data surrounding professional development. These survey items were (a) My district provides useful professional development opportunities to help me learn more about how to use data, and (b) I am adequately prepared to use data. A one-way ANOVA was done to assess the different responses between principals, teachers, and instructional facilitators. Table 1 provides the means for each role. Table 2 provides the ANOVA tables for both items.

Table 1

Means for Professional Development Survey Items

Item	Teachers (n=278)	Principals (n=16)	Instructional Facilitators (n=12)
My district provides useful professional development opportunities to help me learn more about how to use data.	2.29	2.25	2.58
I am adequately prepared to use data.	2.50	2.31	3.08

Table 2

Analysis of Variance of Professional Development Survey Items

Item	Sum of squares	Df	Mean square	F	Sig.
My district provides useful professional development opportunities to help me learn more about how to use data.					
Between groups	1.043	2	0.521	0.728	.484
Within groups	216.895	303	0.716		
Total	217.938	305			
I am adequately prepared to use data.					
Between groups	4.594	2	2.297	3.194	.042
Within groups	217.854	303	0.719		
Total	222.448	305			

There was no significant difference at the .05 level between the three groups on the first professional development item. However, there were significant differences ($p = .042$) between how groups described being adequately prepared to use data. Table 3 shows the Tukey post hoc tests to identify which groups responded differently. These tests indicated, and the qualitative data supported, that instructional facilitators rated themselves as more adequately prepared to use data than principals and teachers did.

Table 3

Tukey's Post Hoc Test: Being Adequately Prepared to Use Data

Item I	Item J	Mean diff. (I-J)	SE	Sig.	95% confidence interval	
					Lower bound	Upper bound
Instructional Facilitator	Teacher	0.583	0.250	0.043	-0.006	1.172
Instructional Facilitator	Principal	0.771*	0.323	0.047	0.008	1.534
Principal	Teacher	-0.188	0.218	0.666	-0.701	0.326

* $p < .05$.*Data Reporting*

Providing reports to campuses is another major function that central office engages in to help campuses identify areas that need improvement in order to help raise student achievement and to daily run the school. Reports that were provided from central office included standardized testing results, discipline data, special education and special population identifiers, campus demographic information, and school improvement reports. Further, campuses often request reports from central office. One campus staff member indicated the usefulness by stating, “There is a district support person if we don’t know how to run a query that we call on our district-wide system. They help us do that.” The district Research and Assessment Office was often cited as being extremely helpful and “creative” at providing additional reports when prompted by individual campuses. The following three sections outline the data reporting functions of the central office including uses of the

data reports, an analysis of the survey responses regarding the quality of reports provided and the emergent theme of too much data that is provided being viewed as a barrier to effective data use.

Uses of the data reports. Uses of the data provided by the district varied greatly by role. Principals, assistant principals, and counselors talked about using data to gain a bigger picture of the overall state of the school. However, they frequently discussed using data to provide individual teacher and student support, such as working with teachers to determine trends or submission to the school's focus teams to consider additional support through response to intervention. One principal stated,

Online [The Internet, NWEA growth assessments] gives good graphs of kids' growth, what they've done over the past year, what skills kids are needing help in depending on what score they have. We use some of that, but a lot of what we do is looking at the kids' actual assessment data that we get [from the district], at the actual hard copies, kind of analyzing that together. I have assessment people sit down with me and we look that over, then we bring it in front of the staff. We try to look at it every which way.

Another principal described her process for data review:

Something that we did this year is when we got our PAWS results back for the winter I sat down and crunched all through them and went and sat underneath all these stacks in my office and looked at every kid's score in our building and said, "We need for the next 6 weeks our focus ... we all missed this set of math questions" and there were 7, no one got more than 3 right. So there's a lot of room for growth in there. And so for my teachers I then gave them the report 5% of our kids failed with less than one right. Ten percent failed with less than two right and so on, so they got for each questions for the PAWS the breakdown of where their classroom was on scoring and then they got the overall grade level. So then I sat down and crunched all those numbers and figured out did we have a hole, where were we in our numbers. Looking at that and looking at our percentages and looking at where we needed to be with where our goal was for the school and then we went in and I observed and made changes and we did strategies.

At the high school level, one administrator stated,

We also put information together by class so teachers had that. And another piece of data that we've used there is looking at failure rate based on classroom grades and now printing out grades for a quarter and having teachers look at grades and categories of grades and looking at how ... what percent of the grade is really standard based and what's fluff. And really starting to ask those tough questions. And at [our school] a piece that we are doing with some teachers that are ready is we're really starting to analyze student work. And taking an assignment and analyzing ... these were the learning goals, do we see it in [this work], so what can we change in our instructional practice.

Additionally, a counselor discussed the process for working with students needing core interventions:

We have biweekly at-risk for RTI [response to intervention meetings] and we move kids in and out of the tiers and we look at their progress-monitoring data and their classroom data, their vision and hearing screening, and all of that stuff, then we move them in and out or adjust their program based on that. We also do quarterly focus meetings where we meet and discuss every kid in the school, and it's the ESL [English as a Second Language] teacher and then there are some counselors.

Instructional facilitators talked mainly about using data to teach teachers about their students and how to use data themselves. Many facilitators acknowledged that one of their main functions with data is to access such data either by computer or through hard copies from the district and then to make copies to distribute to various faculty. A few principals and facilitators discussed working together to complete data charts and completing analysis of the data to advise leadership teams. Teachers most often cited PAWS data provided by the district being used to identify students for the same focus groups mentioned previously and to provide differentiated instruction,

tutoring, or remediation for students. Some teachers also talked about enrichment activities but did not directly relate them to data often.

District Data Quality scale analysis. Analysis of the District Data Quality scale was applicable to the type of reports provided by the district and the extent to which the data were found to be helpful. The District Data Quality scale provides information about principals, teachers, and instructional facilitators’ perceptions of the quality of data provided by the district with respect to how accurate, useful, timely, and informative the data are. Results are shown in Tables 4, 5 and 6.

Table 4

Means for District Data Quality scale

Item	Teachers (n=278)	Principals (n=16)	Instructional Facilitators (n=12)
District Data Quality Scale	2.60	3.18	2.62

Table 5

Analysis of Variance: District Data Quality Scale

Item	Sum of squares	Df	Mean square	F	Sig.
Between groups	5.116	2	2.558	7.489	.001
Within groups	103.495	303	0.342		
Total	108.610	305			

Table 6

Tukey Post Hoc Tests: District Data Quality Scale

Item I	Item J	Mean diff. (I-J)	SE	Sig.	95% confidence interval	
					Lower bound	Upper bound
Instructional Facilitator	Teacher	0.019	0.172	0.993	-.387	0.425
Instructional Facilitator	Principal	-0.563*	0.223	0.033	-1.088	-0.037
Principal	Teacher	0.581*	0.150	0.000	0.228	0.935

* $p < .05$.

The results from the District Data Quality scale indicated significant differences between the responses of the teachers and principals as well as between the responses of the principals and the instructional facilitators. In both cases, the principals indicated that they believed the quality of the data provided by the district was of higher quality than teachers and instructional facilitators indicated. There was no significant difference between teachers and instructional facilitators in the perceived quality of data provided by the district.

Barrier: Too much data. An important subtheme emerged from the primary theme of data reporting. The idea that the district provided too much data was commonly indicated by campus personnel at all levels. One central office administrator involved closely with providing reports and data to campuses acknowledged this as a barrier:

There are some real detriments to having data. And that is that you can data analyze everything and some things shouldn't be analyzed. You need to be really thoughtful about the time it takes and the effort it takes. So it's worth thinking about.

This subtheme of too much data was communicated two different ways: too many reports and a sense of being overwhelmed with the reports.

Many campus personnel noted that there were too many reports. One stated, "Even though this is an amazing time, I think sometimes we are overwhelmed with data. We have so much of it. And the expectation is that you use every bit of it." Another reported, "Data's just complex, I think. And, you get too much of it and you get pretty bogged down and you can't really see what you're looking for when you

get so much.” One said simply, “The data, there is an amazing amount of it.” Central office administrators acknowledged this as a barrier. One administrator stated, “I try and make data available to teachers, but it hasn’t been user friendly enough. I’m frustrated that the people that could be using it aren’t using it.”

The second way that the subtheme of too much data manifested was site-based staff statements during interviews explaining that they were overwhelmed with data and often not being provided with the right data or direction in how to use data provided. Most often, data are provided to campus staff in paper form or on a CD for the principals to print and provide to their teachers as needed. One principal attempted to explain:

I think the district doing this part of it, trying to figure out what data is pertinent and most usable for us and is going to give us the most information I think it’s a really good move. We really are just swamped with data and it’s difficult to focus on what data is useful for what we’re trying to get done.

Teachers expressed their sense of being overwhelmed as well. One special education teacher works with many teachers and students at a variety of levels and reported,

I feel that sometimes that it hinders me. Not to start on a negative note, but I feel so overwhelmed. We have so much data and because I am not working in a classroom, there is so much data there that it’s like, what do we do with all of this? I sometimes feel we duplicate our effort a little bit.

A principal sought a solution to this barrier and found that a part of her job was to help teachers not feel overwhelmed with the data:

I think the hardest part for me is helping [teachers] not to feel so overwhelmed about everything. I think that is hard. If they burn out, the kids feel that. That is really difficult. We’re getting better and better at it. We’ve been doing it for quite a few years. We set goals together what we want to do with the kids,

setting goals with students and parents, and they come and we celebrate at the end. We're really trying to look at our scores.

Goal Setting

As part of the NCSD Improvement Plan, goal setting was identified as a priority. Principals, instructional facilitators, and teachers across the district were expected to set typical and stretch goals on students' growth analysis assessments with their students and to engage in dialogues with parents and guardians. This is another example of how the district central office provides support to campuses in order to improve student achievement. A teacher explained in one interview that this was a clear requirement from the superintendent down. A central office administrator explained the goal setting process as follows:

Alignment of what students learn with what gets tested, setting goals with students all the way from goals on summative assessments to goals on a formative assessment system where students are evaluating their own progress on a regular basis in the classroom.

As a new endeavor, the goal-setting process was well received by campus staff. One principal stated,

Our assessment director for the district has done a great job training us how to do that. But even with those two assessments, to look at those things quite frequently, both at a student level and a school level, we're using goal setting with our students and with our parents. That is another exciting thing in our district that we're leaning towards.

Another principal explained that the goal-setting process implemented by the district was resulting in positive discussions:

Part of the other things that we're doing is the individual goal setting with the child. Here is where you are. So you know, there are kids coming down the hallway with their little 3 x 5 cards saying I've got to grow 21 points or I've got to grow 2 points, but they knew what they were going to have to do

personally. I think that's a direction our district is including in the district improvement plan.

Teachers were likewise pleased with the direction the district provided with setting target goals for students:

We also told the kids their previous scores so they could know what their target score would be for the next test. So, they would have a goal to shoot for and get to the next level, like Proficient, or Advanced Proficient, or Basic, or whatever.

Another teacher explained how the instructional facilitators worked with faculty:

It's good in the fact that our facilitators were the ones this year who pulled up the old PAWS questions and got them out to us. They were the ones that kind of coordinated the goals we were supposed to reach on growth assessments, and that was really helpful.

Despite evidence of these goals-based discussions producing greater clarity for educational focus, no evidence showed professional development was provided to teachers, instructional facilitators, or principals about how to have these discussions with students and parents and at what point to set the goals for each student, given his or her current standing with assessment results. Also, because of the time of year that interviews occurred, there were no current data to show that the summative output of improved student achievement was affected by the input of the newly implemented goal-setting process.

CHAPTER 5:

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The aim of the present study was to better understand how central office curriculum and instruction administrators and personnel use data to support district and campus goals of increased student achievement. A single case study approach was used to analyze a district in Wyoming looking to improve data use at all levels. Information was collected through multiple formats. Focus groups, interviews, and survey data were collected in order to obtain the optimal picture of data use in the Department of Curriculum and Instruction.

Previous studies that included central office data use examined decision making at the district level based on data, district organizational structures that affect data-informed instruction, and the creation of a data-informed culture (Corcoran et al., 2001; Halverson et al., 2005; Honig & Coburn, 2008; Lafee, 2002; Wayman et al., 2007). This study illuminates specifically how data are used by central office curriculum and instruction personnel to improve student achievement.

Discussion of Major Findings

The first research question specifically looked to district Curriculum and Instruction Department uses of data. Analyses showed that district personnel engaged in leadership endeavors purposefully managed to convey the importance of data and the value of data use in instructional guidance. Data reporting to internal and external

stakeholders along with increasing community involvement with data use were also major findings of the analysis.

The second research question asked how central office curriculum and instruction personnel used data to provide support to campuses. This one-way directional analysis looked to show the ways data use at the district level resulted in aiding the achievement of campus goals specific to improved student performance. Analyses showed that providing targeted professional development, data reporting, and aiding in the goal-setting process were the most commonly reported supports provided to campuses. In the remainder of this section, key findings are summarized to outline how the central office curriculum and instruction personnel in this study used data.

Finding 1: Central Office as Provider of Data Support

Overall, the curriculum department provides foundational aspects of data use, and a major function of central office data use is as a data provider. Much of the current work that NCSD's Curriculum and Instruction Department is doing with regard to data use is focused on the tangible. The Curriculum and Instruction Department provides data reports both to campuses and to state and federal agencies for compliance measures. The department provides professional development as well as information to external stakeholders. Most of the current research on data use does not look at the specific actions of the central office, instead considering data use in district central offices in the abstract (e.g. Coburn et. al., in press b; Datnow et al., 2007). Thus, the purpose of the study was to develop a greater understanding of

exactly how central office personnel involved with curriculum and instruction use data to support educational growth at the district and campus level.

It was also found that the Curriculum and Instruction Department provides for data use in a way that is not tangible, but still operating in the role of provider. The department provides voice to the district, constantly seeking for ways to shift the cultural thinking of data use and demonstrate the importance of how data use can elevate current work to the next level to improve student achievement. The following explains how Curriculum and Instruction provides for data use at the district and campus levels including reports, professional development, information to the community and their voice.

Provider of reports. Data reporting is a core responsibility of the Curriculum and Instruction Department in NCSD. The report requests come in a variety of ways. How the district disseminates the reports also comes in a variety of forms. In terms of report requests, many internal and external stakeholders request reports from the department, but few staff members were able to write and run the requested queries. Requests came from senior leadership in the district looking for across-district reports to aide in decision making and program evaluation, campus leadership requests looking for detailed student and campus achievement and demographic data, individual teacher requests, and standard state and federal compliance reporting requests. The actual report product varied from e-mailed files, to data on CDs, to paper reports, to online reports.

It remains to be seen whether the central office should act as a provider of reports in this way. The central office inevitably sets priorities with the reports it provides (Lockhart, 2005). Providing data in NCSD led to data users at the campus and district level feeling overwhelmed. Many times the data provided left faculty to believe they need to use all data reports provided regardless of role. Wayman, Cho and Johnston (2007) do not see this provider function as a positive place for curriculum and instruction personnel to be expending their energy as it creates bottlenecks for access. Indeed, research bears out that teachers and principals should act as independent agents of data access and use, and suggests that data use works best when the person using it is able to access relevant data on their own, becoming more data literate (Earl & Katz, 2002; Lachat & Smith, 2005; Wayman & Stringfield, 2006b).

However, the Curriculum and Instruction Department must play a role in the access of the data and enriching faculty ability in search and incorporation of relevant data into decision making for teaching. Perhaps a better way to conceive of the central office as data providers is in an environment where there is cohesive and thoughtful collaboration with data users at all levels to determine the information that is needed and the best ways to use data for decision making.

Provider of professional development. The Department of Curriculum and Instruction provided numerous opportunities for professional development around data use in NCSD to campus administrators, teachers, and instructional facilitators. Throughout the interviews, personnel from various offices within the Curriculum and

Instruction Department discussed opportunities for professional development on using data. Those involved with special education, career and technology education, gifted and talented programs; the instructional facilitator supervisors; assessment and research staff; and curriculum specialists spoke of professional development opportunities for new or experienced teachers revolving around data use.

What was also found was that not all educators are benefiting from these opportunities. Professional development about data use is an opt-in process in most respects. In order to receive professional development about data use, an educator in NCSD must seek out opportunities or request them for his or her campus or team. For example, interviews revealed that a principal requested an opportunity for the leadership staff or entire faculty, and an instructional facilitator provided direct training to teachers or a team.

When professional development opportunities were taken, interviews revealed that participants were satisfied with the trainings and the responses from the Curriculum and Instruction Department, though there was no evidence that the trainings themselves were offered based on data evaluation or needs assessments. In contrast, data from the survey found that principals ($M = 2.25$ on a 4-point Likert scale), instructional facilitators ($M = 2.58$), and teachers ($M = 2.29$) all felt similarly enough about the usefulness of professional development provided by the district that there was no statistical significant difference.

Interestingly, instructional facilitators felt more prepared to use data, compared to principals. It is not known if this difference between instructional

facilitators and principals is because of more opportunities to be trained and to use data or if the tasks for which instructional facilitators use data are more targeted and specific, compared to the competing priorities of data use in the principal's realm.

Significant to note is that most interviewees discussed the need for more professional development but were not detailed as to what type of support was needed. The focus of requests, mainly from teachers, was simply additional professional development, which may be due to a lack of core knowledge about data use and how it can inform instructional design and delivery. As most of the professional development is designed around principals and instructional facilitators, it is reasonable to believe that the lack of specificity from teachers is based on the notion that they do not have the background knowledge necessary to identify key areas of professional development needs, as supported by research done by Supovitz & Klein (2003), and Wayman & Stringfield (2006b). Survey data reported in chapter four supports the idea that teachers and principals do not feel adequately prepared to use data. If principals do not feel prepared to use data, but the structure of the system designates them as the leader for professional development, there is a possible need to reconfigure the structure of having professional development opportunities offered in this way, thus broadening the responsibility of the central office.

Indeed, the central office should take a more proactive role in helping principals with the design and delivery of professional development opportunities for teachers. But these opportunities should not be limited to traditional professional development opportunities. Developing knowledge in data use may take many forms,

including organized professional development opportunities, mentorship by a data-use expert, or collaboration between teams (Corcoran et al., 2001; Wayman et al., 2007; Wayman & Conoly, 2006) and in fact should be developed based on the thoughtful collection of data including teacher self reflection of development needs.

It is suggested that central offices should provide important information to schools about strategies that improve instructional practice and inform decision-making in the schools and classrooms (Childress, Elmore, & Grossman, 2006; MacIver & Farley, 2003). It is not a stretch, then, to ask that best practices revolving around data use are included in this information, creating a more centralized and comprehensive professional development program.

Provider of information to the community. In this increasingly connected world, technology allows for the transference of information in a variety of ways. The community at large in Wyoming, as well as the parents and guardians of children in attendance at NCSD schools, are looking for more ways to gain information and insight about the progress of children in Natrona County. The Curriculum and Instruction Department and the district as a whole provide this additional information in a variety of ways to the community. Each summer, the district sends parents and guardians a mailing with information about standardized testing and progress towards meeting graduation requirements. The department also participates in the Parent Community Advisory Council meetings, which is a venue for parents, staff, students, the school board, and community members to partner to promote high-quality education.

Beyond this, the district is in the process of updating key communications with the local newspaper and its own Web site. As a district of choice, the district is looking to share additional key information with parents considering school choice, and the district Web site is one place to find key information. Each school is required to have the following information on the main NSCD Web site: general information about the school, staff, curriculum, programs and activities, and community involvement.

Updated PAWS and NWEA assessment results for each school are also readily available on the NCSD Web site. Worth noting is that the curriculum and instruction Web site (Natrona County Schools, n.d.) now has information regarding the District Improvement Plan and why the district did not make AYP during the 2007–2008 school year, plus an 11-minute video explaining the core three steps the department and the district are taking to ensure the essential components are in place to improve student achievement across NCSD. This is an example of how the central office, and the Department of Curriculum and Instruction can provide data to the community, which Warner (2000) suggests is imperative. The public is hungry for information that districts and schools have, but the district must also constantly question what emphasis is being placed on the type of data provided in public forums. Communication to the public from the central office and schools inevitably sends messages of what is valued and measured (Lockhart, 2005).

Provider of voice. Outside the idea of being the provider of information, central office curriculum administrators also owned the role of being the voice of data

use. Administrators had ongoing discussions surrounding the following ideas: Data are valuable, the use of data as a core part of instructional design and delivery is here to stay, and discussions and collaboration about data with colleagues can lead to a more positive culture of data use. The actual implementation of the Curriculum and Instruction Department as the voice of data use was in two forms. First, senior administrators from curriculum and instruction visited campuses and had data discussions with whole faculties as well as campus leadership. Second, the message was also sent during professional development opportunities across the district.

Central offices, and curriculum and instruction administrators in particular, can be this voice of data use and advocate the importance of data at every opportunity; tying data use to instructional design and delivery and making the explicit link to improved student achievement. Researchers including Datnow et al. (2007), Boudett (2005), Earl and Katz (2002), and Wayman et al. (2007), have all noted the importance of creating a culture of data use. One way to do this is to create the structures such as time for collaboration, technology for access, targeted professional development and creating a culture of data use (Coburn et al., in press b; Copland, 2003; Datnow et al., 2007; Lachat & Smith, 2005; Wayman & Stringfield, 2006b), but supporting that needs to be a constant and consistent public commitment and focus on voicing the importance of data use.

Finding 2: Numerous Barriers to Becoming a Data-Informed District

Data use at the central office level can be a time-consuming and multifaceted endeavor. NCSD exemplifies how difficult it is to make the transition from being an

organization of data users to being data informed at all levels. Whereas curriculum and instruction staff provide concrete support to achieve district and campus goals of increased student achievement, during the course of this research, numerous barriers were uncovered that lead to the inability of the district, and of the Curriculum and Instruction Department, to be fully data informed. Included in these barriers were lack of a common vision for data use throughout the district, fragmented implementation of the goal-setting process, the creation of data silos that prevent the sharing of and collaboration with data, and the idea of too much data to work with and consider.

Barrier 1: Lack of a common vision. It became apparent throughout the interviews that NCSd does not have a common vision for data use. Taking that one step further, it is apparent that there is a fragmented vision for what student success and achievement should look like. Research indicates that this collaborative vision is important for a cohesive district unit to begin to achieve campus and district goals of improved student achievement (Datnow, 2007; Honig & Coburn, 2008; Ingram et al., 2007; Wayman et al., 2007). Repeatedly, interview data revealed that though district administrators and campus leadership talked about the importance of data use, and that they believed there was a common vision, none could articulate exactly what that vision was or how it was exemplified on campuses across the district. Many proffered this lack of a common vision was a result of the numerous programs and curricula embraced under the school-of-choice model. One central office administrator said, “Frankly, it’s a district of teacher choice rather than a student or parent choice more than anything else.”

There were many examples of faculty, campus leadership, and central office employees expressing the need for more cohesion and consistency in learning content and expectations. Respondents indicated that data use would be more valuable in meeting students' individual needs if there was greater consistency across campuses when children transfer or transition up. This is not to say that removing the school of choice model is the answer. Instead, key steps should be taken by the district to ensure that there is a clear vision for data use and student success and that the culture of the district supports this (Boudett et al., 2005; Wayman et al., 2006).

Barrier 2: Fragmented implementation of the goal-setting process. The second barrier that was exposed during the course of interviews was the fragmented implementation of the goal-setting process. Setting explicit goals for students and having goal-based expectation-setting discussions with students and parents was one of the three main points of the newly rolled out NCSD Improvement Plan. Though there was evidence that most campuses were engaging in this new process of goal setting with students, there was little evidence that teachers knew how to set goals with their students or how to have conversations about goal setting, both viewed as important in light of current research (Datnow et al., 2007; Schmoker, 1999; Supovitz & Klein, 2003). Further, despite the indication that the process of setting goals with students created a positive experience and increased dialogue with students and community members about student achievement as measured through state-created assessments, little evidence showed a positive association between goal setting,

changes in instructional design and delivery, and student achievement or an explicitly stated process in place to measure the benefit of setting goals.

In addition to the fragmented implementation of the goal-setting process at the campus level, there was no evidence to support that goal setting was occurring at the central office level or in the Department of Curriculum and Instruction. No participants discussed that the offices within the Department of Curriculum and Instruction had their own goals. Additionally, there did not seem to be a common goal set for all student achievement, or disaggregated by grade, student population, campus, or district. If setting specific and measurable goals is a recommended strategy to raise school improvement measures (Schmoker, 1999; Supovitz & Klein, 2003), and it has been recommended that goal-setting occur not just at the campus but at the system level as well (Datnow et al., 2007), then with the lack of goal setting in other areas outside of the student level, there appears to be a fragmented implementation of the goal-setting process serving as a barrier of the central office helping the district and campuses to improve student achievement.

Barrier 3: Data silos. The data silo phenomenon is another barrier to becoming a data-informed district. Though sporadic collaboration was seen between teachers and between instructional facilitators and principals, teachers, and other instructional facilitators, there was little collaboration or sharing of data from curriculum administrators and between principals. Further, no specific structures were in place that allowed for consistent collaboration guided by a data use protocol (see Boudett et al., 2005; Wayman et al, 2006). Though central office curriculum and

instruction personnel did provide data to other central office workers, collaboration at the central office around the data was not evidenced in the interviews, and there was no evidence of principals sharing and collaborating about data at their level, though it is well believed that collaboration and data use must happen together (Coburn et al., in press b; Corcoran et al., 2001; Honig & Coburn, 2005; Lachat & Smith, 2005; Wayman & Stringfield, 2006b).

In the Department of Curriculum and Instruction, the primary driver for the lack of collaboration appeared to be lack of integration of computer systems and technology. That is not to say that data are not shared willingly when asked, but central office staff might not commonly think about who else needs to know the information. This inability to share information via technology created the effect of a common cultural belief that data are “owned” by the creator of the information, leading to possessiveness about data instead of having a shared system as suggested by research that allows for access and appropriate search capabilities that transcend internal departments (Streifer & Schumann, 2005; Wayman et al., 2004; Wayman & Stringfield, 2006b).

Barrier 4: Too much data. Too much data was an oft-repeated barrier for data users across the district but primarily at the campus level. Campus-based staff and some curriculum and instruction staff reported that there was too much data provided by the Curriculum and Instruction Department. It is believed that because the data is provided to campuses, that there is an unspoken assumption that they must use all of the data provided because that is where the Curriculum and Instruction Department is

placing their priorities. Too many reports, too many places and systems to access data, and too much information to process for educators not accustomed to using data to inform educational decisions were all expressed during the interviews. Coupled with this idea of too much data was the idea that not all of the data needed were immediately available or in a form that was easily interpreted, and as a result decisions were made at times without all data. Examples of this were seen at both the central office level and the teacher level.

This idea of too much data in the hands of the user along with the barrier of data silos leads to the natural question of if the data is the right data in the first place (Coburn & Talbert, 2006). This is a combined barrier for the central office, not only stemming for search and access issues with technology (Coburn et al., in press a; Streifer & Schumann, 2005; Wayman et al., 2004), but also with professional development. Ideally, this concern of too much data could be resolved with targeted professional development along with a comprehensive data warehousing platform. However, independent audits completed by the department as to what reports and data are most beneficial for particular roles could open up dialogue and collaboration that would provide useful information to the central office.

Implications

Accountability structures, mass implementation of numerous assessments, increased data availability, and the call for improved teacher and principal quality have affected the way central offices use data (Coburn et al., in press b; Earl & Katz,

2002; Fullan, 2000; Goertz, 2001; Heritage et al., 2008; Schmoker, 1999; Wayman, 2005). This research has identified a number of ways in which central office curriculum and instruction personnel support student achievement with data. Implications of this research include two key points about the central office and data use. The first implication is the idea that *what* school district central offices of curriculum and instruction do with data matters. The second aligns to the first: *How* central offices and the Department of Curriculum and Instruction use data to assess and enrich teacher and principal quality matters.

What Central Offices Do With Data Matters

School district central offices have been viewed at times as a compliance-checking bureaucracy that creates friction for innovation and change (Bryk, Sebrig, Kerbow, Rollow, & Easton, 1998; Muller, 2004). Thus, a common and valid reform strategy is site-based decision making. Yet the current organizational structure of school districts across the nation inextricably unites campuses to the central office. Therefore, unless Curriculum and Instruction empower campuses with the knowledge, skills, and support to make informed decisions based on data, site-based decision making using relevant data cannot be a fully organized and realized reform strategy for entire school systems. Systemic and sustainable data use across a school system is often generated at the central office level, and guidance for schools about how to use data to improve student achievement is crucial to becoming data informed.

However, as stated before, becoming a data-informed district is neither a swift nor effortless journey. Central offices must do more than simply be providers of

information. In order for curriculum and instruction administrators to bring district-wide data use to scale, these administrators need to model what they expect from campuses and to be transparent with all stakeholders about how they use data.

Modeling the expectations of data use is a key component to being data informed and encouraging data use (Honig & Coburn, 2008; Sharkey & Murnane, 2005). This process begins with setting a clear vision for data use, fully implementing the goal-setting process, and creating norms and specific expectations for collaboration about data.

Set a clear vision for data use. The journey to being a data-informed district is fraught with struggles. Indeed, though one major goal of data use is to make the process of teaching more informed, streamlined, and efficient, many schools have found that data use for school improvement is time and labor intensive (Stringfield, Reynolds, & Shaffer, 2001). The process for districts to do the same organizationally is very complex (Halverson et al., 2005; Wayman et al., 2007). Each unique organization faces barriers throughout the process of becoming data informed as well as coming to consensus on a vision.

Central office administrators have been found to be more apt to use data or research in their work when the culture of the district supports data use (Honig & Coburn, 2008). Though faculty and staff across the organization in the NCSD are interested in effectively using data and acknowledge that they would like to be better at using data, there is lack of alignment of what data use should look like and a lack of cohesiveness about how to become informed data users. Datnow et al. (2007)

stated that in order to establish a data-driven decision-making culture, districts must create explicit expectations and norms around data use, state that data use is nonnegotiable, model these norms in every setting, and promote mutual accountability for data use among all educators. This is supported by a process that Wayman et al. (2006) called calibration. Boudett et al. (2005) provided specific protocols for engaging in visioning data use discussions, and Wayman et al. (2006) expressed the need for districts to answer three core questions about data use in order to engage in calibration. Regardless of the process taken for creating a vision for data use, coming to a common consensus and understanding the driving force for why data use is essential are needed in any district making the transition to being data informed.

The Curriculum and Instruction Department plays a major role in the creation of this vision. Indeed, the visioning process should include all major stakeholders (Fullan, 2001; Hanson, 2003; Wayman et al., 2007; Yukl, 2006). However, the direction needed for a comprehensive vision about how to increase student achievement using data through quality instruction, given the unique context of the district and its ramifications on curriculum and instruction should be guided by the curriculum experts in the district due to the difficulty of the visioning process. Setting a clear vision for a district is an involved process, setting one for data use that leads to data-informed instructional choices is compounded by the multilevel organizational structure of many districts, which often results in diverse and dissimilar ideas about what constitutes good instruction (Coburn et al., in press b). Increased student success

is directly related to a viable and essential curriculum that is aligned to the standards and assessments, comprehensive, and effectively delivered (Eisner, 1982; Hirsch, 1996; Marzano, 2003). The vision as to how to use data within the essential curriculum is an important first step towards that student success.

At the end of the day, the district central office must take ownership of the idea that the central office is *central* to the organizational health and improvement of a district. By collaboratively setting a vision for district data use, the central office can show the value of data as it relates to curricular and instructional decision making and make the connection that valuing data is the first step towards incorporating data into the decision-making process.

Fully implement the goal-setting process. Closely aligned to setting a clear vision for data use is the process of setting goals. Not only must there be a collaborative vision, there must also be clear goals at all levels for how a district will achieve success. If school district central offices are meant to steer education in the direction that best meets the needs of students in a given community, a clear direction needs to be set so that there is no doubt what success will look like at the end of the year. It is not enough for a district such as Natrona Count Schools to set the expectation that teachers must create goals with students based on data. Curriculum and Instruction administrators must model the goal-setting process expected to happen at the campus and student level and include relevant professional development that outlines strategies, processes and evaluation of the entire cycle of goal-setting.

Strategic, specific, measurable, attainable, results-based and time-bound (SMART) goals that are agreed upon and supported by the school community are critical for supporting student achievement (O’Neill, Conzemius, Commodore, & Pulsfus, 2006). Not only do they place in writing the main focus for a district, they also show the importance of the goal-setting process and of using data to go through the process.

Schmoker (1999) stated, “The introduction of specific, measurable goals is among the most promising yet underused strategies we can introduce into school improvement measures” (p. 18). Supovitz and Klein (2003) described goal setting as key to improving student learning. Datnow et al. (2007) supported this goal-setting process and concluded that setting student achievement goals at the system, school, and classroom levels is one of the first steps to building a foundation for data-driven decision making. Further, Datnow et al. (2007) stated, “The more explicit and targeted the goals are, the more likely they are to provide a focus for data-driven decision making” (p. 20).

The vision for data use and student achievement should drive the goal-setting process. The vision and related goals that a district adopts show the greater education community what matters most and provide a focus for attention. No matter if the goals are based on improving graduation rates, increasing the number of students from across all distinguished subgroups who take Advanced Placement exams, or setting the goal that each child will read on grade level, setting, monitoring, and

evaluating progress towards goals and celebrating the success of an achieved goal need to be modeled at the macro district level.

Taking the goal-setting process one step further, setting goals should not be limited to the system, school, and student as advised by Datnow et al. (2007). Central office curriculum and instruction personnel also must set specific and measurable goals. However, these goals should be aligned to both the system goals as well as the campus goals. The Curriculum and Instruction Department must serve the needs of both; therefore, administrators working in the department should have a clear set of goals that drive their daily work in support of both the district and the campuses. During the goal-setting process, particular attention should be paid to both how the search for data occurs and how the incorporation and/or exclusion of data results in the actual determination of the goals that are set. Honig and Coburn (2008) caution that the process for goal setting and utilizing data may be hindered by the search and incorporation methods

Set clear expectations and create structures for collaboration about data.

Data use researchers are virtually unanimous in the idea that collaboration and data use go hand-in-hand (Boudett et al., 2005; Coburn et al., in press b; Corcoran et al., 2001; Datnow et al., 2007; Honig & Coburn, 2005; Lachat & Smith, 2005; Wayman & Stringfield, 2006a). The concept of collaboration as a best practice at the campus level has relevancy at the central office level as well, as evidenced by the data silo findings that affected work flow and operations throughout the Natrona County School system. Modeling what collaboration looks like and being transparent about

the purpose of collaboration and the protocols and structures set up to support collaboration are important for Curriculum and Instruction Departments (as well as all departments) to do in moving towards the goal of becoming data informed.

A key step in this collaboration is not only collaborating within the departments of Curriculum and Instruction, thus removing the silos, but also collaborating across the central office as a whole and with campuses. For example, working collaboratively with principals, instructional facilitators and teachers to discuss and determine what data is needed for each of the different positions will allow for deeper conversations about data use. This will also allow Curriculum and Instruction to not merely be seen as a data provider, but as an engaging participant dedicated to data use and its implementation. As a benefit, this may also be a key step that breaks the barrier of too much data. The information provided will be targeted and tailored to the needs of the user, and specifically relevant to the particular work being done. The end result of this will be data that is viewed as useful and beneficial to the teaching and learning process.

Having central office departments engage in collaborative discussions about data serves two primary purposes. The first is actually to engage in the collaboration, which will strengthen decision making at all levels. The second is to understand on a metacognitive level what collaboration about data entails, including the structures needed for collaboration (time, purpose, agreed upon norms, search and incorporation of data, acknowledging pre-existing beliefs and they affect decisions), how access to data and data relevancy affects decision making, and how the end result of using data

to inform decisions can affect teaching and learning. Going through a meta-analysis of the collaborative process will allow for more structured supports for data use, including decisions about data systems and their integration as well as professional development needs. Transference of this knowledge base about collaboration then should be woven into strategically offered professional development at all levels of the district.

How Central Offices Use Data to Assess and Enrich Teacher and Principal Quality Is Critical

The ultimate responsibility of a 21st-century central office focuses on human capital endeavors. A 2007 McKinsey & Company analysis of the world's top performing schools found that, "the quality of an education system cannot exceed the quality of its teachers" (Barber & Mourshed, 2007). Recruiting, selecting, supporting, and retaining personnel, so that each campus and classroom is staffed with the highest quality principal and teacher with the ability to support student learning and achievement, is of primary importance for a district. And yet there was little evidence found that showed using data to inform administrators and curriculum experts in NCSD about teacher or principal quality was a focus.

Research is clear that teacher and principal quality matters in student achievement (Hanushek, Kain, & Rivkin, 1998; Lachat & Smith, 2005; Marzano, Waters, & McNulty, 2005; Peske & Haycock, 2006). Further, some research based on effective school models has shown that schools and school systems that produce above average academic gains incorporate the thoughtful use of data (Datnow et al.,

2007; Lachat & Smith, 2005; Skrla et al., 2000). Research is also clear that campus data use is primarily driven by the leadership of the principal (Lachat & Smith, 2005; Wayman & Stringfield, 2006b); however, teachers are the most important pivot point for using data to improve student learning as they have the clearest access to students and provide direct instruction (Wayman & Stringfield, 2006a).

Unfortunately, principals and teachers are underprepared and lack knowledge about basic data literacy and best practices for data use (Earl & Katz, 2006; Wayman et al., 2007). If *what* central offices *do* with data matters, and central offices should model what is expected at the campus level, then a primary focus should be engaging in these activities in order to provide preparation and knowledge-building skills for principals and teachers that will result in improved student achievement.

Thus there is a two-fold purpose for central office data use as it relates to student achievement. One is to model data use and use that first-hand knowledge of the process to create support structures to encourage effective data use at all levels. Essentially, central offices create the structures and support for becoming a data-informed district and improving principal and teacher quality by going through the data use and goal-setting process. The second is to use data in the modeling process to assess teacher and principal quality and then provide strategically created opportunities for improvement based on that information. Accountability systems based on this assessment should be carefully designed based on the context of the district so that it honors the full scope of what teachers and principals are charged with accomplishing, and not limited to a standardized testing format.

Central office curriculum and instruction administrators should set a clear direction for assessing and enriching teacher and principal quality. The particular focus districts place on assessment of teachers and principals is a delicate and a politically complicated discussion. Currently, there are many versions of how to determine the academic contribution of teachers and principals (e.g. Gordon, Kane, & Staiger, 2006; Sanders & Horn, 1994). Most educators will agree that teachers and principals should not be measured by assessment data alone, but districts must seek a way to use a variety of data to determine if there is a highly effective teacher in each classroom and a highly effective principal leading each school. Regardless of the inputs to get to the assessment and enrichment, the primary output should be a highly effective teacher and principal provided with support and resources to improve student achievement.

With this information, then, central office administrators working with curriculum and instruction must also build a bridge to incorporate the human resource department. Through collaboration with human resource specialists, whose primary focus is the recruitment and retention of highly qualified individuals, curriculum and instruction administrators can ensure that they are highly effective as well.

Recommendations for Future Research

Natrona County School District is a complex institution with a nontraditional educational organization structure. Further, a single case study research model offers many limitations in terms of making broad generalizations of research findings. Even with these constraints, NCSD and the study of central office data use as it affects

instruction and student performance provide a number of opportunities for future research.

Within NCSD there has been a concerted effort to improve data use. At the conclusion of the current study, several improvements were being made towards a more comprehensive vision of what student learning is and how the Department of Curriculum and Instruction needs to support campuses, campus leadership, teachers, and students towards the goal of seeing every student achieve (Mahlum & Dvorak, 2009). Continuing longitudinal research as to the course the district chose to take to make this happen and the results of this initiative would provide additional context and insight into the process of becoming a data-informed district and how the central office plays a “central” role in that transformation.

Conversely, examining a different district shown to be expert at data use, as identified through characteristics put forth in current research (e.g., Wayman et. al., 2007), would provide insight as to what processes, structural supports, and expectations are identified within the Curriculum and Instruction Department that distinguish a highly evolved data-using culture from one like NCSD, which is in the process of becoming data-informed. Using a comparison method of the two districts, an updated or supported model of a data-informed district would add to the current research.

Beyond the scope of Natrona County School District, there are four additional recommendations for future research that derive from the implications section of this chapter. The four recommendations include:

1. The first recommendation focuses on the visioning process. An inquiry as to how a single district or a comparison of districts use data to set a vision for data use and the lessons learned from that process would inform current research that provides prescriptive plans for vision setting.

2. The second recommendation would include an exploration of the process and analysis of the benefits of the data-informed goal-setting process. Specific attention to the association between the process and student achievement would be beneficial.

3. The third recommendation focuses on the collaboration structures for data use. A recommendation for this would be to focus the research on how structures, purposefully provided by the district system-wide, affect collaboration about data at the district and campus level.

4. The fourth recommendation for future research would examine how a district or multiple districts use data to assess and enrich teacher and principal quality, which could include both the strategies of determining value-add and the longitudinal discovery of the affects on student achievement.

Finally, as more best practices about central office data use come out and the knowledge about barriers to the data-informed district are understood, there becomes a great need in districts and in research literature for a comprehensive framework for the data-informed district that would be accessible for both researchers and district administrators. Within this comprehensive framework, districts across the country would be able to go through a data-informed audit to gain a better understanding of

where the strengths and areas for improvement are placed with regards to data use in the district and would know where to look in the literature for key strategies to aid in breaking the barriers and becoming data-informed.

Conclusion

Traditionally, the central office of school districts has been viewed as managing operations such as maintaining facilities, supervising transportation, recruiting and processing personnel for campuses, providing curriculum and instruction guidance, maintaining and managing financial endeavors, and acting as intermediaries for federal or state initiatives and funds (Elmore & Burney, 1997; MacIver & Farley, 2003; Odden & Busch, 1998). There has been little push for central offices to be involved in the day-to-day activities of teaching and learning until quite recently, with various community, state, and federal policy requirements and accountability programs focused on ensuring the academic success of every student in a district. This push for student achievement has forced many educational policy researchers and central office practitioners to reconsider the top-down management focus traditionally embraced and reconfigure central office activities and work practices around direct support side-by-side with schools to improve student learning and achievement (Honig, 2008).

This movement of the central office to focus more on the day-to-day learning and instruction at the schools also comes with increased need for data and increased data reporting structures, resulting in additional personnel or reconfigured personnel job descriptions to accommodate requests for data and provide information for data

use. However, the central office needs to be seen as more than just a provider of information. The central office of a school district must be an incubator of ideas and open to innovation throughout every realm of the organization. The innovations must have a laser focus on the end goal of improved student achievement and be aligned to the common vision of the district. In order to do so, central office administrators must model what they want to see on campuses. Student success must be the goal of the district, but improving teacher and principal quality must be a clear goal for the central office.

APPENDIX A: NCSD AYP 2008

NCSD Adequate Yearly Progress 2008 – Language Arts

Did not meet AYP for Language Arts – All Students

- Bar Nunn, Year 1
- Cottonwood, Year 1
- Mills, Year 1
- Roosevelt, Year 1 (participation and performance)

Did not meet AYP for Language Arts – IEP Students

- NCSD
 - o Elementary, Year 3
 - o Middle, Year 5
 - o High, Year 5
- Bar Nunn, Year 1
- Cottonwood, Year 1
- Manor Heights, Year 1
- Mills, Year 1
- Paradise Vallery, Year 1
- Poison Spider, Year 1
- Willard, Year 1
- CYJH, Year 3
- Centennial, Year 1
- Dean Morgan, Year 3
- Frontier, Year 1 (participation not performance)
- Kelly Walsh, Year 4
- Natrona County HS, Year 1

Did not meet AYP for Language Arts – Free/Reduced Lunch

- NCSD
 - o Elementary, Year 3
 - o Middle, Year 3
 - o High, Year 1
- Bar Nunn, Year 1
- Cottonwood, Year 1
- Manor Heights, Year 1
- Mills, Year 1

- Mountain View, Year 1
- Poison Spider, Year 1
- CYJH, Year 1
- Centennial, Year 1
- Frontier, Year 1
- Kelly Walsh, Year 2

Did not meet AYP for Language Arts – Hispanic

- NCSD
 - o Elementary, Year 2

Did not meet AYP for Language Arts – White

- Bar Nunn, Year 1
- Cottonwood, Year 1
- Mills, Year 1

NCSD Adequate Yearly Progress 2008 – Math

Did not meet AYP for Math – All Students

- Roosevelt, Year 1 (participation and performance)

Did not meet AYP for Math – IEP Students

- Kelly Walsh, Year 4
- Roosevelt, Year 1 (participation), Year 4 (performance)

APPENDIX B: WYOMING AYP GRAPH

APPENDIX C: INTERVIEW PROTOCOL

- *How they use data and what it does for/to them: What do they use and really find useful? How do they access it? What do they need, in the near and far future? What would make their job really good? Do they like it?*
 - *What sorts of support they have for current and future competency: Do they actually have any skills? Where are they learning skills? Are they happy with opportunities to get skills? What do they feel about PD? What would be useful PD for them? Do their teachers have skills and are they getting more?*
 - *How they lead their faculty in data use: What do they think their (a) faculty should be doing? What strategies do they use? What do they think their teachers are capable of now and in the future? Are they hopeful it will affect teaching and learning?*
 - *What they'd really like to have: Daydreaming for the future. This should have been mostly covered with the prior items; but asking the question point-blank is important and should give you a short answer. Be comfortable with "I don't know."*
1. For the record, I'm talking to ____, principal at _____. (Maybe this is a good time to briefly note you're working on a PhD and work(ed) as a building administrator?)
 2. Ask about them
 - Must have: How long they've been at that building
 - Must have: How long as a principal
 - Other experience or any other things you feel like asking them.
 3. What are the most exciting things happening in NCSD right now?
 - In their building? You decide if you want to ask this.
 4. How do you interact with NCSD data in your job? Listen for...
 - What's good about it?
 - What's hard about it?
 - How they use it (what use they make of it)
 - How it helps or hinders them in their job
- (Probe for further info on these two items.)
- What specific types of data do you access or use in your building?

- Listen for the usual suspects
 - Listen for building-specific measures
 - Listen for what they really like to use and what's useful to them.
 - Listen for how they access – computer? Paper reports? Someone else's help?
 - What computer systems do you use for accessing data?
 - How they use them
 - How often
 - What they like and dislike
5. Are you well-positioned to make effective use of data? Probe the following as needed...
- Do you have the right preparation/background to effectively use data?
 - Training in their degrees, workshops, whatever
 - Help the district has given them
 - Where they're getting their knowledge.
 - What they think they might need.
 - Do *you* and *your teachers* get enough Professional Development?
 - What the district does
 - Where they're getting their knowledge
 - What they think they might need.
6. How do you lead your faculty in data use?
- What do they expect out of them?
 - What's hard and easy about it?
 - What strategies do they use (e.g., collaboration, faculty meetings, facilitators)
7. In your perfect world, how would you and your school use data?
- If they're confused, give examples, "maybe your district would provide you a fantastic computer system, maybe your faculty would be using this collaboratively every day, maybe you'd like it to just go away."
 - Must have: what does the district need to do for you.

Pursue the following if you have time:

8. Is there a district vision for student learning? Teaching? Conduct of education?
9. What principals or schools do you know of that are doing really well with data use?
10. Is there anything else you'd like to add?
11. Thank you for your time.
 - We'll be visiting May 15–18, so maybe we'll get to meet.
 - We'll conduct face-to-face interviews and focus groups; it's possible some of your teachers may be chosen for that.
 - If you'd like to contact me, you've got my e-mail and/or phone number, etc.

APPENDIX D: FOCUS GROUP PROTOCOL

1. What are the most exciting things happening in NCSD and their building right now?
2. How do you interact with NCSD data in your job? Listen for...
 - What's good about it?
 - What's hard about it?
 - How they use it (what use they make of it), e.g.:
 - Adjust teaching practice based on data?
 - Differentiate instruction based on data?
 - How it helps or hinders them in their job
 - Who helps them
3. What specific types of data do you access or use? Get as many of these as possible:
 - Building-specific measures
 - Things they may have created on their own.
 - What they really like to use and what's useful to them.
 - How they access – computer? Paper reports? Someone else's help?
 - Always press: *what data?*
4. What computer systems do you use for accessing data?
 - How they use them
 - How often
 - What they like and dislike
 - Anything they invented and use on their own (e.g., Excel sheets)
 - Always press: *what systems?*

Here are the “could haves:”

5. Who helps you use data?
6. How does your principal lead your faculty in data use? (Strategies, help, etc.)
7. Do you feel like you have enough skills in data use? (Training, PD, etc.)
8. Does the district support teachers well in using data?

9. Is there a district vision for student learning? Teaching? Conduct of education?
10. Does data help you be a better teacher?
11. In your perfect world, how would you and your school use data?

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Kerry began her career as a school administrator working for the Leander ISD, where she served as assistant principal at both Charlotte Cox Elementary and Vista Ridge High School. In 2006, Kerry served as Coordinator of Data and Assessment and was admitted into the Cooperative Superintendency Program at The University of Texas. Kerry currently serves as the Program Director of Texas for The New Teacher Project, whose mission is to increase the number of high-quality, dedicated teachers in public schools.

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