Data-Focused Decision Making: One School’s Journey

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ABSTRACT

The use and analysis of data has become a keystone in national policy for educational improvement and a foundational condition in the award of federal grant monies (U.S. Department of Education, 2008, 2009a, 2009b, 2010). Principals are expected to lead their schools in the use of data and are accountable for adequate yearly progress (AYP) for the No Child Left Behind Act (NCLB). Effective use of data can move educators toward student centric learning plans and interventions which improve achievement. While current literature emphasizes the importance of assessment data used to guide sound instructional decisions, gathering scores and generating reports by grade and level does little at individual schools unless there is strong site-based leadership to guide faculty and staff in targeting areas of improvement, implementing a plan, monitoring progress, and adjusting actions.

This qualitative case study describes how the principal’s leadership guided a journey of data-focused decision making at one middle school. This dissertation describes use of data in decision-making processes to promote student learning from the perspective of a school which has been implementing data-focused decision making for several years and was selected for its established use of student assessment data. This research focused on the processes individuals and groups use to better understand and use data within a school context and the role of school leaders in supporting these actions.

The intent of this case study is to describe and understand how school leaders make the use of data an integral part of the operation within a middle school in a large suburban mid-Atlantic school district. By looking at how principals embed data analysis and interpretation in the decision-making processes of the school and engage teachers in the use of data to promote
student learning, findings could be useful as a guide to other educational leaders as they implement site based actions and related professional development for school-based leaders and teachers.
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Chapter One

Data Focused Decision-Making: One School’s Journey

The use and analysis of data has become a keystone in national policy for educational improvement (U.S. Department of Education, 2008, 2009a, 2009b, 2010a). The ability of states and districts to collect, track, and report on student achievement has gone beyond mandated grant requirements and been adopted as a foundational condition in the award of federal grant monies (U. S. Department of Education, 2009a). The expectation that principals lead their schools in the use of data has begun to move beyond the aggregate accountability of adequate yearly progress (AYP) for No Child Left Behind (NCLB) toward student centric learning plans and interventions which improve achievement. The inclusion of structured data use as award criteria for competitive grants emphasizes that collection and distribution of achievement data is not sufficient to ensure academic improvement.

Progress requires informed decision making by teachers and school district leaders. The importance of assessment data used to guide sound instructional decisions has been emphasized by Boudett and Steele (2007), Earl and Fullan (2003), and Hamilton, Halverson, Jackson, Mandinach, Supovitz, and Wayman (2009). Although significant investment has been made to design and implement data systems, there is often limited articulation between district-level use of data for reporting and the use of such data at the school level to improve student instruction. Gathering scores and generating reports by grade and level at the district office does little to improve student achievement at individual schools unless there is strong leadership to guide faculty and staff in targeting areas of improvement, implementing a plan, monitoring progress, and adjusting actions (Bernhardt, 2004; Wayman & Stringfield, 2006).

Principals, as school-based leaders, are uniquely positioned to influence the use of data for evaluative inquiry within their schools. Principal leadership can be a catalyst for data use
within their schools, providing resources and removing barriers to facilitate data use (Copland, 2003). Barriers to the effective use of data may be resistance, lack of awareness, absence of training, conflicting objectives, lack of time, inaccessibility of data, lack of communication, perceived complexity, lack of shared goals, or lack of involvement (Ingram, Louis, & Schroeder, 2004).

**Statement of the Problem**

A hierarchy of responsibility and accountability related to educational improvement exists between the federal government, states, districts, and schools. Student demographic, discipline, and achievement data are reported at the school, district, and state levels and are publically available. These results influence public perception of school quality, which may influence real estate values and thus have economic value (Black, 1998). Punitive associations to data may be tied to federal and state grant requirements, staff compensation and removal, and forced leadership change within individual schools (Fullan, 2005).

District officials expect principals to translate student achievement expectations from top down initiatives into plans of action and lead the implementation of these actions. Ultimately, each principal is responsible for leading some form of continuous improvement within his or her school. Beyond NCLB, the current educational trends in the United States are focused on establishing national curriculum standards and potentially a national standard of accountability. The trend toward uniform longitudinal data systems has gained momentum from the American Recovery and Reinvestment Act of 2009 (ARRA) and Race to the Top (RTTT) funding and forms the core of several national policy documents (U.S. Department of Education, 2009a, 2009b, 2010a, 2010b). There is a strong top down push from federal and state government as well as district pressures on schools to produce and report improvement in student learning and a
growing sense of urgency regarding how leaders can implement practices and organizational structures to support such improvement (U.S. Department of Education, 2009a, 2009b, 2010a).

**Significance of the Study**

The development and implementation of a highly accessible, instructionally focused suite of assessment tools and resources demonstrates unusual vision and commitment by the K-12 school district in which the subject school is located. Few school districts have implemented a system that focuses well beyond the accountability required by state and federal government. Inclusion of features, that allow teachers to create and administer formative and summative assessments and access the results nearly instantly, presents opportunities for teaching and learning which directly benefit students.

Although the implementation of this curriculum resource and assessment system has already demonstrated benefits to the district, school-based leaders are required to translate district goals to site-based actions. The district has provided professional development resources to enhance local school data analysis and implementation of professional learning communities as a support structure. A study which examines how leaders influence the use of assessment data as evidence for making instructional decisions within their school may act as a guide for other school leaders as they implement site-based actions. Further, the information gathered from this study may help prioritize future enhancements and related professional development for both school-based leaders and teachers.

Hess and Kelly (2007) combined 210 syllabi from 56 principal preparation programs and found that only 2% of the 2,424 course weeks focused on school-level issues related to accountability and less than 5% on managing school improvement with data, technology, or research. Future principals may benefit from research of school-level program implementation
of assessment, data management, and decision making and this requires that principals take an active role to lead such improvement.

**Research Questions**

1. How has the principal of Central Middle School made the use of data an integral part of the operation within the school?

2. How has the principal of Central Middle School embedded data analysis and interpretation in the decision-making processes of the school?

3. How has the principal of Central Middle School engaged teachers in the use of data to promote student learning?

**Operational Definitions**

Adequate Yearly Progress (AYP) – term created for Title I schools to monitor improvement gains and now used as a measure for improvement gains for all subgroups in the No Child Left Behind Act of 2001. States develop their own standards. This measure is the main accountability metric (White, 2005).


Collaborative Learning Teams (CLT) – a term Central Middle School uses to refer to content specific teaching teams, often used interchangeably with the term professional learning community.
Formative Assessment – evaluations given at regular intervals of a student’s progress with feedback to assist student performance, provides direction for improvement of instructional program, individuals, or classes (Bernhardt, 2004).

Instructional Resource Teacher (IRT) – personnel authorized and funded by the state to train teachers to effectively integrate technology and software into instruction.

Mobility Rate – percent of a school’s enrollment entering or reentering after the first official membership count (September 13, 2010), or leaving school prior to the last day of the school year (District Student Mobility Report, 2010-2011).

Pass Advanced – scaled score which is 25% higher than a pass proficient on state test

Predictive Value – a practice adopted by Central Middle School (CMS) which uses a combination of common benchmark assessment scores, students’ previous state test scores, and longitudinal test data associated with individual teachers to predict state test scores and set improvement goals.

Professional Learning Communities (PLCs) – a structure of collaborative teams whose members work interdependently to achieve common goals (Eaker, DuFour, & DuFour, 2002).

Race to the Top (RTTT) – $4.35 billion fund established via ARRA legislation to advance school reform in four areas which include building data systems that track student information, and inform teachers and principals about how they can improve instruction; to qualify, states must have no legal barriers to linking student growth and achievement data to teachers and principals for the purposes of evaluation.

Recognized ASCA Model Program (RAMP) – American School Counselor Association national model certification for delivering a comprehensive, data-driven school counseling program (ASCA, 2012).
School/District-wide Report Card – public report, published annually which reports the state of public schools and their progress toward goals.

Summative Assessment – evaluation(s) designed to provide information regarding student achievement at the end of a period of instruction (Bernhardt, 2004).

**Limitations**

This case study is limited to a single high achieving school within a large district. The ability to generalize conclusions from this study is limited to the reader’s capacity to relate the descriptive data to their own needs and experiences. The results of this study may not be representative of other schools, to include schools in the same district.

**Delimitations**

The researcher narrowed the scope of this study to focus on exploring and describing how leaders promote and support the use of data operationally, in decision-making processes, and instructionally within a single school. The location for this study is a high-achieving suburban school. The researcher chose this school for study based on its high use of a district-wide assessment system and a strong peer-based perception that an established model of supported data use exists to inform instructional practice and improve learning. Although federal, state, and district leadership practices influence the use of data within schools, the focus of this study was on the leadership practices and support structures that were observable within the study school. The literature review focuses on data use for accountability and school improvement as well as educational and organizational structures that support the use of data for decision making. Literature related to implementation of large data systems in K-12 to identify relevant organizational themes at the local school level was a specific focus.
Organization

This study is organized into five chapters. Chapter one contains an overview of the study, information about the importance of leadership and current emphasis on the use of data in public education, the statement of the problem, significance of the study, research questions, operational definitions, limitations and delimitations of the study, and an overview of the dissertation. Chapter two contains a review of related literature in the area of data use for accountability, assessment, school improvement, implementation, and organizational structures which support the use of data by schools. Chapter three contains an overview of the methods, research design, the setting, and participant selection process, data collection procedures, data quality and data analysis procedures, and a summary of methodology. Chapter four includes a presentation of data from interviews with school-based administrators and CLT focus groups, and document analysis. Chapter five contains a summary of findings, implications, recommendations for further research, and conclusions.
Chapter Two

Review of Related Literature

The influence of school-based leadership on the use of data to improve instructional practice is a relevant area for structured academic research. Increasing expectations by local, state, and federal entities hold school-based leaders responsible and accountable for continuous instructional improvement. The impact of many policy-based decisions is often not known until changes filter down to the district and ultimately to the school level (McLaughlin, 1990; No Child Left Behind, 2002; Rand Corporation, 1975). Educational reform rests firmly on the shoulders of educators and their immediate leadership. Access to comprehensive, informative, and current educational data is essential. The ability of teachers and school leaders at all levels to make data-informed decisions can be severely limited without easy access to essential data (U.S. Department of Education, 2009b; Wayman, Stringfield, & Yakimowski, 2004).

A U.S. Department of Education expert panel reviewed related literature covering the past 20 years and found only six studies of 490 citations which met their causal validity standards as evidence to support their recommendations in practice. This expert panel made five major recommendations in a practice guide for using student achievement data to support instructional decisions: (a) make data part of an ongoing cycle of instructional improvement, (b) teach students to examine their own data and set goals, (c) establish a clear vision for school-wide data use, (d) provide supports that foster a data-driven culture within the school, and (e) develop and maintain a district wide data system (Hamilton et al., 2009). Deike (2009) identified structured time and professional development as two principal promoted activities which provide cultural support and motivate staff to use data.
Educators involved in school-wide collaborative data use, organized around clearly focused questions, generally acknowledge the value of data to inform educational practice (Cousins, Goh, & Clark, 2006; Lachat & Smith, 2005). However, resistance by some educators and disagreement about which data elements and how data are used, continue to shape the ways in which data are used by public schools (Ravitch, 2010). School districts across the U.S. make decisions, usually based on some form of data, every day. Research studies related to successful data use by school teams, and led by school leaders, have the potential benefit of translating to actions that improve learning.

Despite improved access to data, questions persist related to how educators do and should use data to make instructional decisions. The use of data within schools is influenced by uneven change between organizational structures implemented to support the use of data and existing school culture (Arriaza, 2004). The use of data and related tools is more likely to become a sustained part of the culture when there is close synchronization between the rate of implementing change and adaptations in a school culture. Mandinach, Rivas, Light, Geinze and Honey (2006) analyzed the use of data-driven decision making tools in six school districts and found that even teachers with technical literacy and data access did not understand how to interpret or use the data. They identified data literacy, assessment literacy, and pedagogical data-driven decision making literacy as necessary to function in a data culture.

**Implementation of Assessment Systems**

This review of related literature focused on educational theory and practices associated with the implementation of assessment systems within K-12 school districts in the United States. Searches of related literature were conducted over a three-year period using academic databases, professional libraries, electronic dissertation databases, practitioner journals, corporate-
sponsored studies, educational technology trade journals and association publications, state educational websites, association publications, and commercial implementation studies. Google Scholar searches were performed using specific search terms to include; evidence-based decision making, data-driven decision making, data-informed decision making, formative assessment, leadership, PLCs, and implementation.

Academic articles provided foundational information and historical background in the areas of data use in education, implementation, formative assessment, professional learning communities, and leadership. Three areas of concentration emerged within the body of literature as foundational to the use of educational data: (a) implementation practices related to technology supported data systems, (b) use of data by educators, and (c) professional learning communities. This literature review discusses a foundation for the relationships between the above topic areas and the use of data to inform instructional practice. Relationships between leadership and support structures which influence faculty adoption of successful data use practices are multi-variable (Copland, 2003; Herman & Gribbons, 2001; Lachat & Smith, 2005; Louis, Leithwood, Wahlstrom, & Anderson, 2010). The topics included in this literature review are intended to provide a framework for this study.

**Historical Background**

Educational improvement initiatives focused on data-based decision making have repeatedly emerged over the past 100 years in the United States. Understanding the historical context of how educational decision makers have used evidence in the past to improve practice is of value in understanding questions that continue to challenge modern day educational leaders. Both the answers to, and the emphasis on questions such as what constitutes evidence; who is and should be empowered to collect, analyze and implement changes to current practice; and
how educational leaders influence and make decisions have changed given the pendulum swing toward open publication of previously internal school information.

Decision making, made in the name of educational improvement and reform, has been influenced by generations of practitioners and researchers. Gamson (2007), in his historical perspective on decision making, discusses the transition of education from a culture based on philosophic inquiry toward scientific measurement from 1830 to the present day. Gamson offers salient conclusions that seem at first to be in opposition: that it is difficult to challenge problematic origins of data once collected, as evidenced by the unquestionable reliance on IQ scores in the first half of the 20th century, and that a great deal of past decisions have followed a common sense rather than data analysis approach. However, when framing these conclusions within the question of “are we measuring the right things” one can better understand that data alone are not information. School districts that collected data to investigate and improve education existed in the 1920s and 1930s, while fundamental reform existed in large urban school districts in Denver, Houston, St. Louis, and Los Angeles (Gamson, 2007).

Murphy (1999) depicts historical changes in the profession of school administration by categories. An overlapping progression of theory has come into existence since 1820 on philosophy, management, social sciences, and school improvement. School improvement is the most recent center of gravity founded in education and fueled with applied knowledge (Murphy, 1999). A 20th Century dominant paradigm of scientific measurement, IQ theory, behaviorist learning theories, and social efficiency curriculum fostered the development and dominance of objective test data in education (Shepard, 2000). Objective test data continues to be the predominant information collected and used by local practitioners in the quest for educational improvement.
The concept of collecting school data began more than a century ago, but the translation of data to educationally useful information has not yet been fully realized. Shepard (2000) attributes this partially to the “default” framework which drives current practice. We teach in new and constructionist ways, yet we continue to test or measure knowledge in traditional, old fashioned ways, that result in misalignment between instruction and assessment. Teachers and policymakers still work on the 20th Century belief system of measuring ability and achievement while curriculum has moved on toward constructivist learning theories. When students are assessed with standardized tests which do not assess what they are learning, the results of assessment are distorted. A group project to develop a local recycling awareness campaign is more accurately assessed by a rubric-based presentation of the project than by a multiple choice or fill in the blank exam.

Thompson (1994) describes instrumental, symbolic, and conceptual approaches as three common ways educators use data such as student assessment results. Go/no go decisions, such as test score cut off, to determine student eligibility for enrollment in advanced courses is an example of instrumental use of data. Symbolic use of data is often used to satisfy some external requirement such as AYP, division-wide standardized test scores, or to justify a decision that has already been made. Conceptual use of data provides a frame of reference in which to evaluate a program or issues. Conceptual data use may help educators recognize that multiple possibilities exist to explain problematic achievement patterns within their school (Murnane, Sharkey, & Boudett, 2005). The use of student assessment data is conceptual when used for the purposes of decision making for school improvement.
Data Uses

**Accounting and data collection.** Student data systems are electronic information systems used to organize and manage student data. Hardware and software provide educators storage of and access to current and past data as well as the ability to present the data in different views or formats. Educators have increasing access to information about student achievement, attendance, standardized test scores, and demographics (U.S. Department of Education, 2008). Modern data systems often extend to teachers’ desktops and can allow educators to manipulate views and groupings of select information about students (Wayman, 2005).

The necessity to collect data and provide reporting has spawned a number of technology innovations that go beyond traditional student information systems. In a comparative research study of 60 school districts, the Council of the Great City Schools and MDRC, Inc., looked at the progress in student achievement between districts. The study found that faster-improving urban school districts provided early and ongoing assessment data, training, and support to principals and teachers to facilitate the use of data to improve teaching and learning (Snipes & Casserly, 2004). Technology did not emerge as a major theme in the study, but rather as an enabling tool for management and decisions. Districts with similar technical capabilities had dissimilar student achievement results. They concluded that the data, and how individuals use this information, are more closely associated with student achievement than the technology itself. Although these tools have matured and become more sophisticated, the true potential to positively impact students remains at the local or school level (Wayman et al., 2004).

School management systems include subsystems of assessment information, learning management information, and administrative information. They emphasize that access to, and
the presentation of, information necessary to assist educators in decision making for teaching and learning is the starting premise for school information system design (Breiter & Light, 2006).

As a direct result of NCLB, state and federal mandates require schools to collect and report data. This has changed educators’ priorities in a relatively short period of time. School districts must collect student test scores, capture school and district data, analyze information, target areas of improvement, provide remediation, reallocate resources based on need, and frequently report this information in a variety of formats. Once organized, data can translate to a district or school-wide report card or accountability measure by which school leaders may be evaluated, promoted, rewarded, and dismissed.


Accountability describes a relationship between two parties in which four conditions apply: first, one party expects the other to perform a service or accomplish a goal; second, the party performing the activity accepts the legitimacy of the other’s expectation; third, the party performing the activity derives some benefits from the relationship; and fourth, the party for whom the activity is performed has some capacity to affect the other’s benefits. (p. 35)

Accountability and compliance reporting are no longer optional for districts since the legislation of the revised Elementary and Secondary Education Act (ESEA) (No Child Left Behind [NCLB] Act of 2001---Public Law 107-110).
Barriers to the acceptance of accountability measures as opportunities for the improvement of educational practices persist within schools. Ingram, Louis, and Schroeder (2004) identified cultural, political, and technical challenges which face administrators that want to improve the use of standard and accountability data in teacher decision-making processes. Cultural barriers are (a) teachers develop their own personal metrics, (b) teachers and administrators base decisions on professional judgments rather than data, (c) stakeholders disagree about data types and priorities of student outcomes, and (d) some teachers don’t associate their own performance with student performance.

Many educators view data with loathing, as a burden on their time providing little utility (Doyle, 2003). Unless data are relevant and understood, they are not useful and will not be welcomed. Web, Robertson, and Fluck’s (2005) case study research found that teachers held accountable to a school’s cultural norms through surveillance and self-regulation produced expected behaviors, but did not develop accountability expectations that benefited themselves or their students. Ingram, Louis, and Schroeder (2004) attributed mistrust of data and resulting teacher avoidance to data use resulting from frequent political use of data.

Districts without access to professional development to accompany data tools are less likely to develop processes to study their data and will struggle to meet accountability expectations (Wayman, 2005). Collaborative use of data is related to increases in professional culture, interdepartmental collaboration, requests for professional development, time, and teacher expectations for students at risk of academic failure (Wayman, 2005).

Technology-based assessment systems can provide teachers with frequent and timely assessment results in relevant reports. Technology increases the efficiency and timeliness of data gathering, but is the less challenging component when compared to developing the human
capacity to use assessment and data to benefit learning (Heritage & Yeagley, 2005). Principals and teachers require support in the use of data to improve teaching and learning (Lachat & Smith, 2005). Program evaluation studies are consistent in the finding that targeted and on-going professional development is important to the successful use of data by educators (US Department of Education, 2008; Rand Corporation, 1975). Murnane, Sharkey, and Bourdett (2005) in a yearlong workshop study to assist teaching teams and administrators from 10 Boston public schools in the use of student assessment results identified three supports which assisted school staff use of assessment results for instructional improvement.

(a) A process for engaging in conversations around teaching and learning

(b) An opportunity for support of analyses of data from their school

(c) Leadership committed to the endeavor

Building Teacher Data Capacity. Schools must create a climate where leaders support and expect data-driven decision making. White (2007) uses the term “data on purpose” to describe the intentional collection and analysis of data as a collaborative effort to enhance teaching and learning. Data on purpose leads to first-order (direct changes) in the classroom and to second-order (system level) changes in school culture that can benefit students (White 2007). This philosophy echoes findings that data are best used for improvement, rather than for accountability purposes (Katz, Sutherland, & Earl, 2002).

Teachers must acquire the analytical expertise required to truly consume and use data for decisions to inform instruction. The U.S. Department of Education’s National Educational Technology Trends Study 2005 -2007 (NETTS) concluded that teachers who felt supported in their use of data within their schools were more likely to use data to identify learning gaps and make decisions about changes in instruction (U.S. Department of Education, 2008). The
Blueprint for Reform places strong expectations on the expansion of expertise in data use within the ranks of public education (U.S. Department of Education, 2010a). These expectations alone will not facilitate positive change. An infrastructure of evidence-based school assessment, collaboration, and improvement planning supported by leadership at the school level is required to achieve and sustain a culture of instructional improvement (Louis et al., 2010; Mason, 2003). Mandinach, Rivas, Light, Heinze, and Honey (2006) also observed that school-based leadership appeared more important in facilitating or impeding the use of data and tools than did the philosophy or goals of the superintendent or district.

Access to data and the ability of school-based leadership to establish a clear vision for school-wide data use are critical to ensure that information is translated to action within schools (Hamilton et al., 2009). Activities initiated and supported by school-based leaders form a foundation for a culture of acceptance. This continued support by leadership is essential to sustain a culture of data use and inquiry (Herman & Gribbons, 2001).

Implementation of a data system used for decision making involves a collection of activities performed by site-based leadership. Hamilton et al. (2009) provide specific activity recommendations to establish a clear vision for school-wide data use: (a) establish a school-wide data team that reinforces data use, (b) define critical teaching and learning concepts, (c) develop a written plan which includes activities, roles, and responsibilities, and (d) provide ongoing data leadership. Data leadership includes establishing processes and policies, setting expectations, and nurturing a culture in support of continuous instructional improvement (Mason, 2003).

The concept of enhancing education through technology is included as part D of NCLB. The Enhancing Education Through Technology Act of 2001, §2402 (NCLB 2001) places
emphasis on access to instructional technologies, data, and resources, but also establishes that 25 percent of all educational technology funds be spent on professional development:

A recipient of funds shall provide professional development in the integration of advanced technologies, including emerging technologies, into curricula and instruction and in using those technologies to create new learning environments, such as professional development in the use of technology-

(a) To access data and resources to develop curricula and instructional materials;

(b) To enable teachers –

   (i) To use the Internet and other technology to communicate with parents, other teachers, principals, and administrators; and

   (ii) To retrieve Internet-based learning resources; and

(c) To lead to improvements in classroom instruction in the core academic subjects, that effectively prepare students to meet challenging state academic content standards, including increasing student technology literacy, and student academic achievement standards. [Public Law No. 107-110, §2416]

Kerr, Marsh, Ikemoto, Darilek, and Barney (2006) examined strategies used by three urban school districts to promote data use for instructional improvement and the resulting effect on administrator, principal, and teacher practice. They found that teachers, who put more time and effort into developing and promoting data use strategies, also reported greater instructional outcomes. Mason (2003) identified professional development as a key incentive mechanism which motivated teachers to use data.

**Formative Assessment.** In most states, large-scale assessments are used to rank-order individual schools or districts, not for the purposes of modifying classroom instructional practice
The cost benefit of formative assessment as a tool to increase student achievement may be compelling when compared to costs to further reduce student to teacher ratios in classrooms. Regular use of classroom formative assessment could raise student achievement by 0.4 to 0.7 standard deviations (Black & Wiliam, 1998); improvement that would rank the United States in the top five internationally in math achievement (Wiliam, 2007). A research-based cost estimate comparison of extra months of learning gained per year and classroom cost per year yielded: for a 30% class size reduction [3 months/$30,000.00], increasing teacher content knowledge by two standard deviations [1.5 months/unknown cost] and the use of formative assessment [6-9 months/$3,000.00] based on the studies by Hill, Rowan, and Ball (2005), Jepsen and Rivkin (2002), and Wiliam, Harrison, Lee and Black, (2004) (as cited by Wiliam, 2007). This comparison appears compelling, but its weakness is that costs and results estimates are derived from multiple research studies. It would be very difficult to control for cross-environmental and cultural factors associated with actual classroom costs between studies. This model could be useful, but should be closely examined if used as a justification for reallocating resources away from professional development or student-to-teacher ratios in the classroom.

An emerging trend toward meaningful school improvement as evidenced by the literature relates to the use of formative assessment data as part of an iterative process to provide feedback to instructional methods and thus improved student achievement. Black and Wiliam (1998) define formative assessment as:

…those activities undertaken by teachers, and by students in assessing themselves, which provide information to be used as feedback to modify the teaching and
learning activities in which they are engaged. Such assessment becomes formative when the evidence is actually used to adapt the teaching to meet needs. (p. 2.)

Meaningful school improvement can be measured by a number of standards, but since NCLB, a widely accepted measure is student achievement as evidenced by test scores.

The ability to use data for evidence-based decision making offers opportunities to improve student learning, increase community support, increase professionalism within public education, and empower students to take ownership of their educational goals. Brunner et al., (2005) in a two-year exploratory study of the New York City public school system’s Grow Network initiative, intended to observe the use of data reports to inform teaching and learning in grade levels three through eight. The study had to be altered to accommodate the cultural changes that took place during the implementation. Changes took place as the school system introduced other resources for accountability. Policies and priorities changed as a result of the innovation [solution] introduced by the assessment reporting system. Brunner et al., (2005) found that reports from a large scale assessment reporting system made data more accessible to administrators and teachers for decision making. The information (Grow Reports) made available to administrators and teachers created a bridge between standards and test results. Educators used the outcome of testing to alter their classroom practice. Data were used for resource planning, professional development planning, and to focus on students close to but not achieving proficiency testing levels.

Classroom teachers used Grow data reports more frequently and for purposes that differed from that of administrators. Based on survey data, Brunner, et al., (2005) found teachers used Grow data to make decisions within their practice in four major categories: (a) classroom planning and individualized instruction; (b) as evidence to support conversations about student
learning with parents, administrators, and other teachers; (c) self-identified and guided professional development; and (d) as information given to students or academic conversation between the teacher and student. In the survey, 91% of teachers used reports to determine class strengths and weaknesses, 89% used data to prioritize what they teach, and 76% made lesson planning decisions. Grow data were used less often as a basis for conversations about student learning; 62% with parents, 52% with students, 47% with other teachers, and 38% with administrators/staff developers.

Administrators used Grow assessment data for identifying resource needs, school planning, supporting conversations, and selecting appropriate professional development activities for teachers. Ninety-three percent of administrators used data to identify low-performing students for additional resources, although only 53% used data to allocate funding. Administrators used assessment data 87% of the time for conversations with teachers, 73% with other administrators, 70% with parents, and 55% with students. Administrators used data for implementation decisions, but decisions varied depending on their role or position in the school or district. Administrators used information predominately to address problems and goals based on their individual priorities or those that were associated with their position in the organization. The usefulness of Grow reports diminished over the course of the school year because these reports were static reports based on standardized test scores.

Sustaining a continuous cycle of improvement enabled by the effective use of data requires leadership support and the belief by all stakeholders that this is a top priority (Wayman, Stringfield, & Yakimowski, 2004). However, ineffective leadership renders data analysis less productive. Schools with negative cultures represent models of limited learning systems (Argyris & Schon, 1978) where group processes are highly competitive, low in trust, and adverse
to risk-taking. Limited learning models often occur in highly-defined organizational structures and include individuals with specialized roles. These leaders value chain-of-command communication and compliance with standards, but devalue free collaboration and communication. School cultures that have a positive atmosphere and place high value on learning communities can sustain momentum for school improvement (Hipp, Huffman, Pankake, & Olivier, 2008).

Making decisions, based on data that result in measurable and meaningful school improvement, requires confident, well-prepared, collaborative leadership at both school and district levels. Leaders that examine evidence and act to investigate explanations surrounding situations or problems look below the surface for understanding. Creighton (2005) refers to leading from below the surface, emphasizing that a deeper examination of data is necessary in order to understand all the possible explanations for the data to prevent errors in interpretation and potentially poor decisions based on those errors. In a case study of an urban elementary school’s response to the Texas Accountability System, Booher-Jennings (2005) found that data can drive decisions that target students for remediation at the expense of students with greater need. Students on the verge of proficiency are often referred to as bubble kids because their scores are statistically near the cutoff for passing. Focusing resources and attention on bubble kids is a way to improve school test scores in the near term, but is not considered a long-term intervention. This form of educational triage, when used to provide resources to students most likely to bring up aggregate test scores associated with NCLB reporting, can have the unintended consequence of leaving specific children behind (Booher-Jennings, 2005).

Empowerment and teacher leadership are identified as important factors in cultures of evidence-based decision making. Anderson (2004) found that formal leadership roles impedes
teacher leadership in practice because formal leaders blocked participation by some individuals and reduced distribution of decision making within the school. Leadership influence often occurs mutually between teacher leaders and the principal (Anderson, 2004).

Developing the capacity to sustain a culture of data-driven decision making within an organization entails developing an “evaluation habit of mind” (Katz, Sutherland, & Earl, 2002; 2005). Canada’s Manitoba School Improvement Program Inc. (MSIP) was a capacity building initiative to improve secondary student learning outcomes. MSIP required participating schools to produce annual evaluation reports and offered professional development workshops where teachers, coordinators, administrators, students, and parents learned to assemble and interpret data (Katz, Sutherland, & Earl 2002). Interviews of 22 principals found that they regarded the required annual accountability reports as burdensome. As the reporting process became more familiar, principals found the practice useful to address school improvement and external requirements. Although accountability was the initial requirement, over time principals built a capacity for using data as evidence for school improvement decision making.

A small qualitative case study (four participants) analyzed preconceptions, frameworks, and reflections based on the roles of the participants in a nine-week graduate course (Katz, Sutherland, & Earl, 2005). The purpose of the course was to teach the process of using data to make informed decisions. Participants, principal, assistant principal, consultant and teacher, each demonstrated different preconceptions about the use of data as well as what should be discussed and addressed as part of the professional development activity. The principal felt that the course information would be useful to promote staff discussion. The assistant principal valued the course for self-improvement and reflection related to accountability which was similar to the consultant’s experience. The teacher experienced a paradigm shift, beginning with anxiety
related to the use of data and moving to data as an inquiry tool. This study, though limited to one individual in each category, demonstrated the personal and professional growth associated with changes in attitudes as a result of data exposure and participation. Participant perspectives and preconceptions about data use were associated with their role within the organization and their individual opportunities to work with, analyze and interpret data. Further, participants’ self-reflection helped facilitate their personal paradigm shift to decision making based on data evidence (Katz et al., 2005).

Assessment and Data

White (2007) describes three data classifications: learning data, teaching data, and leadership data. Learning data is “after the fact data” that include student formative, summative, traditional, and embedded assessments. Learning data can be used to gauge how students or groups of students respond to instruction. Teaching data are records of frequency, quality and consistency related to teacher actions and practices. Teaching data combined with learning data reveal relationships between teachers’ actions and student learning. Leadership data are based on quality and consistency of leadership practices. Leadership data include quality and frequency of collaboration, feedback, self-monitoring, reward, and support of professional development (White, 2007).

Kerr et al. (2006), in a study of three urban school districts, focused on actions which promoted data use for instructional improvement. The actions investigated included (a) school improvement planning, (b) district assessments, (c) data systems, (d) technical assistance to schools on data use, (e) professional development on data use, (f) encouragement of review of student work, and (g) systematic classroom observation. Two of the districts, each with different strategies, were able to create a data-driven culture. Researchers attribute stronger use of data by
schools in these two districts to higher levels of data use support resources by these districts. Recommendations included further research regarding the extent to which teachers changed classroom practice as a result of data use.

Plans for such actions are developed using analyses of data in White’s three classifications and combined with known educational best practices. This combination provides a catalyst for positive impact on student achievement. A successful strategy or action plan, as evidenced by progress in academic achievement, includes a commitment to data-driven, informed decision making and instruction based on early and continuing assessment feedback to teachers and principals (Snipes & Casserly, 2004). Administrators and teachers trained and encouraged to use assessment data can diagnose teacher and student weaknesses and feed adjustments back into instruction. Based on a meta-analytic synthesis of over 500,000 findings from studies of influences on student learning outcomes, instructional and assessment-based teacher feedback had the largest effect size (Hattie, 2003) (as cited by Rowe, 2007).

Sustaining and encouraging a culture of data use toward change requires leadership actions to maintain an iterative cycle of continuous data-informed improvement (White, 2007). School leaders form a hub of authority in the center of various activities that empower and sustain activities to facilitate the use of assessment data toward goals of student achievement. Ten acts of leadership surrounding their authority are necessary to facilitate progress and remove common barriers to supportive cultural change. White (2007) provided examples of the acts of leadership as:

(a) modify time, (b) modify opportunities, (c) provide corrective feedback, (d) replicate successful practices, (e) make midcourse corrections, (f) analyze diverse types of data,
(g) collaboratively implement and evaluate common assessments, (h) develop and test hypotheses, (i) tailor training to needs, and (j) commit resources. (p. 213)

Educators are not traditionally trained to examine, analyze, and act on assessment data. Teachers and administrators do act to make changes, but they typically target these changes for the next semester or the next school year. When schools first begin to focus on data to inform instructional decisions, they tend to collect and attempt to make sense of an overwhelming amount of information (Gallagher, 2007). Schools unaccustomed to working with assessment data are easily overwhelmed as compared to schools which received the necessary professional development, coaching, and time (Hipp & Huffman, 2003). These are crucial supports for examining and working through the process of data interpretation. Professional development programs designed around the skills required to select, analyze, and interpret data are not part of the traditional teacher training model. To be valuable, this training should be integrated in professional development (Boudett & Steele, 2007).

State required assessments, which are not aligned or out of sequence with district curriculum, can be viewed by teachers as irrelevant and burdensome (Mason, 2003). District and locally-created assessments allow closer alignment with curriculum and can offer teachers more relevant feedback to instructional practice. Nebraska was one of the first to adopt a statewide system of local assessments, the School-based, Teacher-led Assessment and Reporting System [STARS]. Nebraska chose to grant districts autonomy to design assessment processes to meet the state standards (Roschewski, 2004). Districts may use locally-designed assessments, but are required to use a standardized writing assessment and some state-wide scheduled assessments. The quality of the assessment process and content is monitored and supported by the state. Nebraska’s STARS is considered a unique implementation of assessment because it meets the
requirements of NCLB reporting using classroom-based assessments as an alternative to a single state test (Roschewski, 2003). This system focuses on measuring school improvement over time while preserving local curriculum. The commitment to assessment is top down from the state legislature, but the implementation and use of assessments is bottom up. The state mandates the quality standards and requires districts to establish how they will meet the measures of quality. Placing this responsibility with the district enables school systems to assess student learning within their curriculum rather than as an add-on activity which increases instructional relevance.

Nebraska Department of Education supports assessment literacy and has instituted pre-service requirements in assessment, an assessment leadership endorsement program for teachers and administrators, interactive training, and data retreats (Gallagher, 2007). A three year study of implementation of STARS found that schools were in different stages of cultural change related to the innovation. Some school cultures exhibited a mature acceptance of, and engagement in, assessment [opportunity] while others viewed the testing process as accountability [threat]. The importance of school culture cannot be overemphasized as it relates to any innovation or change but appears particularly important in the successful use of assessment data. In order for assessment to inform and change instructional practice, teachers must understand and accept assessment practices. Even within schools which have an established culture of data use, not every participant understands and accepts change related to the implementation and engagement in the assessment information process to improve student learning.

Accountability is inevitable when measures are taken, associated with students, classrooms, and schools and then made available to anyone other than the examinee. Regardless of the nature of assessment, formative or summative, local, state, or standardized, it is ultimately
an evaluation of teachers, students, and administrators (Earl, 1998). Gallagher (2007) contrasts opposing views of assessment as accountability versus engagement and finds that engagement is attained when the emphasis of accountability shifts away from an external requirement to internal ownership of accountability. Views are dependent on the culture of the school and individual teacher perceptions; threat/opportunity, policy tool/instructional tool, event-based/ongoing are tensions that exist between opposing viewpoints. Experts have different views regarding evaluative qualities of assessment related to how they interpret benefits and risks.

While individuals that choose professions as accountants or business analysts may be very comfortable interpreting and evaluating the quality of data in the abstract, educators value data which support instruction (Murnane et al., 2005). Teachers are more successful in developing the capacity to use data when they gain experience using a more integrated approach. When teachers work with and learn to analyze their own data they gain more relevant experience (Cousins et al., 2006). Applying data-driven decision making to staff training provides practice and coaching. Using real data from teacher and administrator on-line assessments are highly applicable and relevant in making decisions to improve staff development which translates to improved student learning (Gold, 2005).

Stiggins (2007) identified two foundational assessment lessons; that assessments be accurate and that results be used productively. Just as change for the sake of change is wasteful and builds resentment, assessment for the purpose of assessing is equally futile. Assessments must be designed to measure a defined, purposeful target and provide useful, productive results. Assessments which are not aligned to benchmarks, standards, or instructional goals may yield scores that cannot be accurately applied to inform teacher practice or feedback to students. The
skills required to write good assessment questions, based on identified standards, are learned over time and require practice and training (Stiggins, 2007).

On-line or technology-based assessment tools are often approached with an innovation-centered viewpoint. In the context of education, an innovation is a new way of organizing work or administrative organizational change adopted as a solution to a problem. The innovation seems attractive due to expectation of the reduced time and effort required to administer, obtain, analyze, and publish results. When schools focus on the innovation, their goal usually consists of implementing the innovation while overcoming whatever obstacles present themselves (Marcovitz, 2006). However, schools must remember that the innovation is a tool to achieve an educational objective. Regardless of how easily administration of such a system might be, the system possesses little value for teaching and learning if the content of the assessments are not aligned with standards, benchmarks, and indicators of academic success, or if the questions do not accurately measure the target area.

**Implementation**

Implementation is what actually happens when an innovation is put in place (Fullan, 2001), that can and does differ from the plan. When an organization adopts a new idea, program, solution, or puts a structure in place and expects people to change as a result, the term implementation describes the associated process. Adoption is a term that implementers of programs or technology solutions use to describe a phase of change that occurs after decision approval but prior to implementation. The action of implementation moves the focus away from the innovation and toward the people affected by the associated change (Marcovitz, 2006). People facing change have diverse philosophies and concerns that influence how quickly they engage in and accept an innovation, if ever.
Several models with various stages and categories describe how quickly individuals adopt innovations or accept change. Rogers (2003) grouped individuals as (a) innovators, (b) early adopters, (c) early majority, (d) late majority, and (e) laggards. The Concerns-Based Adoption Model divides stages of personal concern related to the innovation and level of use of the innovation (Hall & Hord, 1987). Apple Classrooms of Tomorrow (ACOT) used a three dimensional occupational stress inventory (OSI) to self-survey teacher adjustment to role, personal strain, and coping resources (Baker, Gearhart, & Herman, 1990). All models have a similar progression regarding the acceptance and use of an innovation by an individual or school community.

The ACOT study used five descriptive categories: entry, adoption, adaption, appropriation, and innovation which describe how technology is used and accepted but is expectantly innovation-centric. The central premise for the ACOT study was education through the use of technology (Dwyer, Ringstaff, & Sandholt, 1990). The Concerns-Based Adoption Model is more appropriate to gauge an implementation of a formative assessment system because it encompasses the stages of use and the personal concerns and emotions of the people within the realm of the change.

The success or failure of implementation is influenced by many factors and is exceedingly complex. When implementation requires a change in people rather than, or in addition to, inanimate objects, “cookie cutter” approaches are inadequate to attain success. Fullan (2001) identifies nine critical factors for a successful implementation, which he grouped in three categories: (a) characteristics of the innovation/change project, (b) local roles, and (c) external factors, as key causal variables that influence implementation. State tests, standardized
test reporting, and NCLB are examples of external factors related to a formative or summative assessment system.

Characteristics of change include the perceived need for the change and communication clarity about the purpose of the innovation. The complexity of the responsibilities of individuals that are part of an implementation is a key characteristic. The more complex their responsibilities, the more likely the implementation will not occur as planned or proposed. Quality of change is the difference between superficial change and deeply rooted change which leads to substantial reform or cultural change (Fullan, 2007).

Local characteristics of a large scale implementation are often the most variable, and because of their proximity to students, the most valuable or the biggest source of perceived burden to school-based educators. Local characteristics include the district, community, principal, and teacher. District administrator support is essential to a change in district practice (Fullan, 2001, 2007). In the case of New York City Public Schools, top down support was critical in implementation of the Grow data reports. Without emphasis by district leadership, teachers and school-based administrators are often unmotivated to learn new tools and accept new roles and responsibilities (Brunner et al., 2005).

Implementation of formative assessment encompasses four steps: learning from development, dissemination, reducing obstacles, and research (Black & Wiliam, 1998). Learning from development is equivalent to piloting a new solution. A small group of select and willing participants, representative of the larger group, are chosen to go first. A pilot allows the participants to help develop and improve the larger scale implementation plan based on their experiences and the problems and challenges they encounter. This is one way to introduce an innovation, try out an implementation process, gain buy-in/acceptance from participants, and
accept or make changes as necessary. A pilot is different from the concept of a staged implementation that takes place at few locations at a time. A pilot implies that changes will be made in the field and that data collected will be used to make improvements and changes as necessary for the benefit of those that come later. A pilot may also lead to a decision to pull back or cancel the implementation. It is important to recognize that a pilot may not be sufficient to gather evidence of cultural change. As stated earlier, change is slow and can take one to three years or longer (Fullan, 2007); a one year pilot is unlikely to yield evidence of student achievement or cultural change.

Dissemination is a low support, low resource, slow time frame strategy of deployment or implementation. Participants have access to the program and resources, but there is not yet a strong push or encouragement to spur use. As an example, this method would allow teachers access to formative assessment test items followed later by the staff development courses and eventually a requirement that participants use the system or participate in the program.

Prior to requiring that participants use a formative assessment system, obstacles should be removed. Obstacles may be previous systems or external tests that were used prior to adoption of the formative assessment items. Black and Wiliam (1998) identified external tests and teachers roles in differentiating and separating formative and summative testing as a primary obstacle for teachers. Without targeted professional development, teachers may not have an understanding of how to use formative assessment to inform the instructional cycle. Both external and summative tests receive primary reporting focus, but formative tests provide fundamental tools for evaluating understanding and ongoing adjustments to instruction.

Research or evaluation is an important final step to an implementation of a formative assessment system. Interestingly, just as formative assessment is designed to provide feedback
information that educators can use to make adjustments to teaching and learning, the last step of implementation can and should be used for the same reason. Continuous improvement is an iterative and necessary aspect of successful implementation. Weiss (2007) describes a cycle of continuous instructional improvement that teachers use to adapt their instruction to meet the needs of their students based on experience, learning, and evidence and thus ultimately improve their teaching practice. A continuous cycle of improvement includes phases to set goals and align resources, instruct students, gather and share data, analyze data, and use information to create action plans. Action plans, once implemented, form the basis for setting new goals and resource alignments. For example, the New York Achievement, Reporting, and Innovation System (ARIS) was designed to support continuous instructional improvement. This system, available to all New York City public school teachers and administrators, encompasses assessment, reporting, and analytic tools for educators. ARIS also provides educator, parent, and student access to periodic assessments. Periodic assessments predict student performance on the New York State Tests and are used to assess grade level skills (NYC Department of Education ARIS, 2010).

**Professional Learning Communities**

Professional Learning Communities (PLCs) are closely related to the concepts of communities of practice (Webb, Robertson & Fluck, 2005), learning communities, professional communities, and learning organizations (Senge, 1990). The school district in this study places strong emphasis on PLCs to support school-level data use. The bases of PLCs, distributed leadership, shared vision, and shared goals serve as important supports in an evidence-based culture. Mason (2003) concluded, based on findings from three research studies of Milwaukee Public Schools, that PLCs can contribute to positive school culture and provide structures to
facilitate effective use of data by administrators and teachers. There is an expectation by the district in this study that the maturity of PLCs in district schools is highly related to leadership and the use of assessment data to improve instructional practice (DuFour & DuFour, 2010). Wenger (1998) summarizes communities of practice as groups of people that interact regularly and share a concern or passion for something they do. These groups continue to learn and improve through their continued interactions. Communities of practice develop and mature through a series of shared activities, such as problem solving, experience, coordination, and discussion (Hipp & Huffman, 2003). This concept is not unique to education and is applicable to all organizations of practitioners, business, government, and associations. Educational communities of practice are unique because education is both the learning process to achieve the goal and the end product of the effort.

PLCs are groups of individuals which have a shared understanding of mission, vision, values, and goals. These groups are further distinguished by collaborative and interdependent teamwork as well as a commitment to continuous improvement (Eaker, Dufour, & Dufour, 2002). There are three major themes which define a PLC: ensuring students learn, creating and sustaining a culture of collaboration, and a focus on results (Dufour, 2004).

The organizational learning qualities of PLCs have great similarity to the work of Peter Senge (1990) who proposed five disciplines that organizations and the people within them require in a transformation to a learning organization. The first discipline is personal mastery which encompasses a self-awareness and willing attitude for learning. The second discipline is a mental model; a thought process that can be applied to organizational activities. Constructing a shared vision or future for the organization is the third discipline. The fourth discipline is a commitment to team learning which places value on interdependencies within the organization.
The fifth discipline is systems thinking, which can be described as an approach to problem solving that relies on understanding the relationships between components of the problem or organization rather than the isolation of individual problems.

The establishment and sustainability of PLCs is complex and inseparable from school culture and change (Fullan, Bertani, & Quinn, 2004). School cultures which support trust, openness, and reflection are associated with the successful development and sustainability of communities of practice. In a three-year ethnographical study, Hartnell-Young (2006) observed 32 teachers and principals in 12 schools that identified elements of teacher-led communities of practice based on roles. Teachers expressed two different attitudes regarding standards and accountability; some felt constrained while others were creative and focused on the choices within a framework that encouraged student learning. School cultures that valued collaboration and exploration were not focused on accountability and were able to implement both structural and cultural changes. The Hartnell-Young (2006) study points out the importance of interdependence in communities. Those communities that share strengths to accomplish shared goals are able to compensate for increased expectations on the teachers.

Schools are complex and dynamic organizations that are constantly in flux. The establishment of learning communities is a change in instructional culture and a change in existing relationships between teachers based on, and in support of learning. Hipp et al. (2008) described three levels of maturity related to PLCs:

(a) Initiation – the decision, by faculty and staff, to make the change, innovate

(b) Implementation – related concepts are put into practice, structural changes may be put in place to facilitate collaboration
(c) Institutionalization/Sustainability – the change is ongoing and is fully incorporated in the organization (p. 175-176)

A case study of sustainability of PLCs, conducted five years after the original PLC implementation study found strong evidence of shared responsibility, teamwork, learning structures, problem solving of critical issues, inclusive and distributed leadership, shared governance, and an emphasis on teaching and learning (Hipp et al., 2008). The study included two schools, with dramatically different demographics and specialized programs. Both schools were considered high performing based on their high standard state achievement test scores. Leadership in both schools can accurately be described as inclusive with shared responsibilities. Administrators empowered teachers in decision making to facilitate change by turning over these responsibilities to leadership teams. This empowerment was possible because strong trust relationships had developed. Principals focused on strategies and resources to support the decisions made by leadership teams, which facilitated teaching and learning. In one of the schools, a chain of leadership succession, principal to district office, assistant principal to principal, and teacher leader to assistant principal, provided a continuity which may have played an important role in sustaining the culture. Organizational change in schools requires three to ten years to accomplish (Fullan, 2001), which is consistent with the findings of the Hipp study.

Strahan (2003), in a qualitative reexamination of a three-year study of the North Carolina Lighthouse Schools Project, examined the collaborative culture of three high achieving elementary schools. These schools improved state achievement scores by more than 25% over a five-year period. Examination of the professional culture within the study identified purposeful conversations and collaboration as major contributors to success. The maturity of the culture in these schools allowed data-directed conversations centered on student achievement.
Conversations were guided by assessment systems and observation. Teachers and administrators participated in an iterative process of achievement-focused data and dialog referred to as a reform spiral (Strahan, 2003). Schools that have well-functioning PLCs find ways to continually improve practice. The creation of collaborative cultures of data use to inform collective decisions (Boudett & Steele, 2007) describes data wise schools that look at data, analyze data, and then use data to create an action plan.

Sustaining a learning community is a journey, not a destination. Even schools that demonstrate an established PLC are subject to disintegration due to attrition, reorganization, budget cuts, or external factors. Giles and Hargreaves (2006) concluded that three innovative schools studied as learning organizations and PLCs remained more resistant to change than traditional schools. Resistance to change, in their study, is associated with retaining a positive culture, innovation, and shared vision. These schools were able to resist change because the culture was accepted and internalized by the faculty. Based on a review of qualitative research on the impact of PLCs, well developed, mature PLCs have a positive impact on teaching practice and student achievement (Vescio, Ross, & Adams, 2008).

Establishing and sustaining a positive culture related to assessment and change is critical in establishing an open and collaborative environment where discussion and ideas can be presented in a receptive atmosphere of respect and mutual trust. Professional learning communities are defined by qualities which facilitate common goals, and a shared vision that is focused on teaching and learning. Relationships between maturity levels of professional learning communities and successful implementation of formative assessment to improve teaching and learning is a complex and highly cultural topic. The implementation of formative assessment, to inform and adapt instruction to increase student learning, appears to rely on a culture similar to
that which a PLC strives to establish. A review of the literature demonstrates that there is foundational evidence of this relationship and that school-based leadership is required to achieve and sustain a data informed culture.

**Summary**

Technology-based assessment systems enable evidence-based decision making. The implementation of systems which provide frequent and timely assessment results may facilitate a shift in focus beyond accountability toward instructional improvement. Use of formative assessment data provide opportunities to identify learner-centered problems and inspire discussions centered on instructional practice. Implementations of technology that provide data for instructional improvement are influenced by variables within individual school cultures. School-based leaders may have unique opportunities to promote evidence-based instructional decisions through the use of assessment data by communities of learners. Established, well-functioning professional learning communities, supported by school-based leadership, potentially provide a sustainable support structure for school improvement and student learning (Bolam, McMahon, Stoll, Thomas, & Wallace, 2005). The value of assessment has been demonstrated and continues to be debated as it relates to NCLB and high stakes testing. Formative assessment is used to inform practice, and, if implemented with success, can improve teaching and learning.
Chapter Three

Methodology

Chapter three describes the methodology used to conduct a qualitative case study of data leadership for instructional improvement by the principal and other school members within the operation of a high-achieving middle school. Specifically, the goal of this study was to examine and describe how actions of the school leaders influence the use of data in the school. This chapter describes the rationale for a qualitative method for this case study, the role of the researcher, setting, site and participant selection process, informed consent and permission procedures, data collections procedure, data quality procedure, data analysis procedure, and a brief summary.

Research Questions

1. How has the principal of Central Middle School made the use of data an integral part of the operation within the school?
2. How has the principal of Central Middle School embedded data analysis and interpretation in the decision-making processes of the school?
3. How has the principal of Central Middle School engaged teachers in the use of data to promote student learning?

Assumptions and Rationale for a Qualitative Design

A qualitative case study was selected to describe how a principal leads the phenomenon of data use to inform instructional decisions. This method was chosen because it is important to establish the meaning of the phenomenon, observable occurrences related to the use of data, from the viewpoint of the participants (Creswell, 2009). This research focused on the processes individuals and groups used to better understand and use data within a school context. Case study is appropriate when there are many variables of potential importance in understanding a
phenomenon and for studying educational innovations (Merriam, 2009). Information that describes important processes, key issues, and answers to interview questions was collected in the natural setting to allow observation of behavior and actions. A case study allows the investigation of a contemporary phenomenon within a real-life context when the boundaries between phenomenon and the context are not clearly evident (Yin, 2009).

**School Selection Procedures and Setting**

**Selection Process**

Purposeful sampling was used to select the study school. Purposeful sampling is appropriate for situations where the investigator seeks to discover and understand a phenomenon occurring within the site selected (Merriam, 2009). This selection strategy is a form of nonprobability sampling used to pick cases for a study which are information rich and provide the appropriate data for in-depth study (Patton, 2003). Selection of extreme, critical, unique, or deviant cases is based on rare or atypical attributes appropriate to the research topic (Merriam, 2009; Patton, 2003; Yin, 2009). Data reports from the district’s system-wide assessment tool were examined to determine if any schools were outliers in the use of a newly implemented district-wide assessment system. In this case study, the bounded system of a single school, was selected based on high use of the district assessment system as compared to other schools during that time period. The subject school is known within the district as being at the forefront in the use of data for instructional decisions and further distinguished by presentation of their data use model at a state level educational conference.

**Setting**

This study took place in a fully accredited, public middle school, grades seven and eight. The school, located in a large mid-Atlantic suburban school district, has a current enrollment of
approximately 1000 students. The student population consisted of 5% African Americans, approximately 30% Asians, slightly less than 50% Caucasians, less than 10% Hispanics, and students identified as others 7%. Over 10% of the students qualified for free/reduced lunch, while both limited English proficiency and school mobility were less than 10%. Over 30% of the students participated in school- and center-based gifted and talented programs.

**Participant Selection**

The collection of data began by interviewing the current principal at CMS, after the interview, he introduced the researcher to the other school administrators. These participants included the director of student services and the two assistant principals. The principal acted as a key informant and recommended including the former principal as an important source of information about data use at CMS. The former principal recommended the former instructional resource teacher as a pivotal participant and resource. The principal and assistant principals were key informants and information from their interviews guided the selection of collaborative learning teams for focus groups interviews.

**Informed Consent and Permission Procedures**

The researcher followed all guidelines set forth by the Institutional Review Board (IRB) at Virginia Tech (VT). A protocol of informed consent was followed to ensure participants’ rights to confidentiality. This protocol included obtaining permission from VT IRB prior to the collection of any data for this study. The researcher also followed all guidelines, conditions of approval, and protocols required by the school district’s research board. Participants were notified orally, and in writing, about the goals of the study and the methods of data collection, analysis, and data management that were used in the study. The informed consent agreement indicated to the participants that they could present questions and study concerns in person, by
electronic mail, or by telephone. Additionally, participants were notified that they could review the written transcript of their interview and add additional statements which they felt were valuable. The participants were free to withdraw from study participation at any time during the interview, focus group, or observation processes.

**Assurance of Confidentiality**

According to Creswell (2005), the ethical researcher guarantees study participants confidentiality, which means refraining from identifying individuals specifically. Complying with informed consent will assure confidentiality of the target school. Study participants and the data corresponding to each participant received pseudonyms. Each participant’s assigned pseudonyms, referencing their name and position assignment, will remain in a secure location, separate from the data files, for researcher use only. Participants’ anonymity, achieved through pseudonyms and data coding, was used to reduce participant anxiety during observations and encourage open, unfiltered interview responses.

The only individuals with data access were the researcher and her advisor. An electronic copy of the data was stored on the researcher’s password protected personal computer within an encrypted folder. A backup copy of the data resides on a strongly encrypted external hard drive with password protection which is locked in secure location. One copy of the digitally recorded interviews and one hard copy of all transcribed interview data, observational data, and physical artifacts are stored in a locked personal filing system to provide the necessary security to ensure confidentiality. The researcher will erase electronic data and shred hard copies of all other data three years after collection.
**Researcher Bias**

In quantitative research, the researcher tries to eliminate bias, whereas, in qualitative research, researchers accept and acknowledge that it may exist and understand that researcher bias is likely to occur unless measures are taken to minimize the effects (Patton, 2003). As a result, the researcher for this study acknowledges work experience in both middle and high school teaching and information technologies.

For the past 17 years, the researcher has held multiple roles in schools: teacher, department chair, school renewal committee, technology coordinator, and central office information technology coordination specifically in testing and evaluation of instructional technologies. Additionally, the researcher has been formally trained in project and process management and organizational theory related to leadership. This background experience allows the investigator to be sensitive to school culture, central office expectations, and field based assessments related to the use of data for assessment and decision making.

Multiple safeguards were utilized during this study to minimize researcher bias. Data were collected from multiple sources and triangulated to establish credibility, conformability, dependability, and transferability (Merriam, 2009). Member checks and peer review were used throughout the study to further reduce any researcher bias. The researcher offered all participants a transcription of their personal interview data and sent the principal’s transcription for his review prior to working with other participants. The director of student services and former instructional resource teacher were contacted to clarify information and check for accuracy. These member checks were used to validate information accuracy about processes and instructional practices at CMS. Virginia Tech professors peer reviewed coding themes and organization to determine appropriate alignment with the research questions. The researcher
kept detailed records of occurrences (reflective journaling), and periodically detached from the situation in order to review records, monitor observations, and control for researcher bias.

**Data Collection Procedures**

Data were collected from interviews, teacher focus groups, and document analysis. Interviews of key school leaders guided by the topics of inquiry, focused on student learning, goal and results orientation, collaboration, reflection, shared values and beliefs and commitment to continuous improvement. Participants involved in interviews and focus groups had the opportunity to review the written record at a later date to ensure accuracy and to permit any follow-up questions or comments. The researcher categorized data based on the initial themes that guided the interviews and that emerged from the interview data. Documents included public information from the school’s website, course catalog, school improvement plans, and other resources identified by key informants within the school setting.

**Interviews**

The researcher used a combination of interviews as the primary source of data for this study (Yin, 2003) to capture the perspectives of school leaders. An informal conversational interview strategy was used with the school principal, since it offers flexibility and the opportunity to understand individual and situational contexts (Patton, 2002). The researcher developed a series of theme related guiding questions for the principal interview (Appendix B) and former principal interview (Appendix E) in collaboration with university professors and piloted the questions with an administrator within the same district but outside of the case study site. This allowed the researcher the opportunity to validate interview the format and length, and to refine main themes and transcription technique based on the pilot interview. The researcher developed an interview protocol to conduct semi-structured open-ended interviews with the
school’s assistant principals, guidance director, and school instructional resource teacher (Appendix C).

Marshall and Rossman (2006) suggest that a critical aspect of interview strategy is conveying the attitude that the participant’s views are valuable and useful. Cooperation between researcher and participants is essential since this technique relies on a high degree of personal interaction and superb listening skills. Prior to the interview, each educator signed a consent form (Appendix A) permitting the session to be digitally recorded and transcribed verbatim for data analysis. Total participants included six administrative participants and 11 focus group participants. Each participant was assigned a pseudonym to maintain anonymity.

The researcher compared individual interview data with successive interviews as well as with other data sources within this study. Merriam (2009) describes this constant comparative method of analysis as a way to identify patterns in the data so that relationship patterns between the data can be arranged to identify emergent common categories. Member checks, also known as respondent validation, were offered to participants to review researcher analysis of study data and provide input as a way to reduce misinterpretations and researcher bias (Merriam, 2009). Member checking was used during this study to ensure internal validity and as a mechanism to elicit guidance from key informants. Participants provided input to help the researcher further identify appropriate interview opportunities and supporting artifacts.

Focus Groups

Merriam (2009) describes focus groups as interviews with a group of people that have knowledge about a specific topic. Focus groups allow participants to hear each other’s responses to a researcher’s questions and to consider their own views within the context of the social interaction of the group (Patton, 2002; Yin, 2009). The goal of using focus groups, within this
case study, was to obtain high quality descriptive data within the social context of teaching teams’ use of data. Focus group participants were determined by collaborative learning team membership, voluntary participation by team members, and identification by key informants at the school. The principal recommended the science and social studies CLTs for focus group participation because they were the most mature with respect to their data use. The assistant principals coordinated participation by the seventh grade science CLT and the seventh grade social studies CLT at CMS. A total of 11 teachers participated in focus group interviews; four science and seven social studies.

Focus groups allowed the researcher to collect information about the topic of data use by teachers, and how teaching teams interacted with each other related to this topic. Interactions which occur within focus groups are different from naturally occurring interactions, since the researcher has constructed who participates and guides the conversations using an interview protocol. The researcher developed an interview protocol to conduct semi-structured focus group interviews (Appendix D). Merriam (2009) recommends that a group moderator be familiar with group processes. For the purpose of this case study, the researcher has experience as a core subject team teacher and department chairperson at the middle school level as well as formal group facilitation training.

**Document Review**

The researcher collected and reviewed documentation and artifacts from the School Improvement Plan, publically available communications, and web pages. Documents related to the topic provided important data and served an important role (Yin, 2003) in data collection for this case study. During site visits, the researcher collected data reports, professional development materials, school calendars, and other relevant documents shared by interviewees
and key informants. The researcher categorized information within these documents for later analysis and as a triangulation source with interview data.

**Data Quality Procedures**

**Validity**

Validity in qualitative research relies on the accuracy of researcher findings. Since qualitative research can never be entirely objective, researchers use several strategies to increase the credibility or validity of their findings. Creswell (2009) describes eight primary strategies and recommends the use of multiple strategies to check the accuracy of findings. This study employed five strategies to ensure accuracy of results: triangulation of data sources, use of member checking, self-reflection to clarify researcher bias, peer debriefing, and the use of rich, thick description of findings. These strategies are described as they relate to internal and external validity within this study.

**Internal validity.** Internal validity means that a researcher has recorded the appropriate target data as intended and that the data interpretation and research findings accurately capture the reality of the study (Merriam, 2009). The use of a variety of data sources is one of four basic types of triangulation and is most appropriate for the purpose of this study (Yin, 2009). Data triangulation is a validity strategy that qualitative researchers use to demonstrate accuracy of findings and convince readers of this accuracy (Creswell, 2009). Triangulation strengthens a study through the use of different data sources or inquiry methods to test for consistency in findings (Patton, 2002). Data collection opportunities within a case study come from a variety of sources of evidence and are necessary to strengthen the study. Patton (2002) states that understanding inconsistencies between data sources is an opportunity to gain greater understanding of the relationship between inquiry approach and the phenomenon under study.
Member checking, which served as a means of checking for clarity and understanding (Merriam, 2009), was conducted by sharing results including emerging codes and categories or themes with Virginia Tech professors and an experienced K-12 educator. The researcher consulted with the principal and other participants to ensure accurate data representation. Member checking included consultation with the director of student services and the former instructional resource teacher to review data outcomes and gain clarification about the evidence collected.

**External validity.** External validity is a measure of the how well the findings of a study might be applied to other situations (Merriam, 2009). A limitation of this study is the subject is a single, high achieving middle school. The transferability of the findings of this study to other schools is reliant on the researcher’s ability to deliver a rich detailed description of the context of the study and the reader’s perspective and interpretation of the findings. According to Stake (2000), personal reflections are a tool to aid in the description of the phenomenon. Ortlipp (2008) details the value of using a reflective journal to record researcher experiences, opinions, thoughts, and feelings during a study. A written record allows insights and shifts in a researcher’s perspective and bias to be a visible and an acknowledged part of the research design, data generation, analysis, and interpretation process.

Exploratory and reflective journal writing allowed me to map my growing and changing understanding of my role as researcher, interviewer, and interpreter of the data generated via interviews, and to record decisions made and theoretical justification for the decisions. (p. 703)

Reliability within qualitative research is related to dependability and consistency of results when compared to data collected as part of a study (Lincoln & Guba, 1985). As a check for
plausibility of findings, data collected were also peer reviewed by an experienced K-12 education professional knowledgeable about data use in education (Merriam, 2009). Finally, a portion of the dissertation committee members reviewed and critiqued the appropriateness and assignment of themes prior to the completion of data analysis by the researcher.

Data Analysis Procedures

Data Management

Data collection began after the IRB application for both Virginia Tech and the school district were completed and approved. A letter introducing the researcher and explaining the goals and procedures of the study was provided to the school principal for approval before distribution to participants within the school. Interviews were digitally recorded and transcribed. Information from interviews, observation notes, and relevant documents were labeled by type and source and entered as text using NVivo 9, qualitative analysis software from QSR International (http://www.qsrinternational.com). The use of analysis software allowed the researcher to keep information organized and allowed data to be compared and re-arranged in order to establish patterns and themes. The researcher used a constant comparative process to develop a coding scheme that encompassed all data collected throughout the study (Merriam, 2009).

Summary

The intent of this qualitative case study was to understand and describe the relationship of leadership and the use of data for instructional decision making to improve student learning within a middle school. This chapter provides a description and rationale for the methodology and sample selection process for this study. The researcher shared the rationale for a qualitative
case study approach. The researcher provided an explanation for data collection and analysis in this study as well as a basis for assuring validity and reliability.
Chapter Four
Findings
Central Middle School

Over the last eight years, Central Middle School has successfully integrated the use of data as a driver in operational, instructional, and programmatic decision making. In 2009-2010, the school had a population of approximately 1000 students with the following ethnicity: slightly less than 50% White, approximately 30% Asian, 5% Black, less than 10% Hispanic, and 7% identified as Other. Limited English Proficient (LEP) population was less than 10%, and the students with Special Education services population was 8%. The students who were eligible for Free and Reduced Lunch was over 10% and the mobility rate was 5.4%. The school is fully accredited by the state Department of Education. Current Accreditation Pass Rates based on the 2009-2010 tests are as follows: English 99%; History 99%, Mathematics 99%, and Science 100%. Central Middle School houses a gifted and talented (GT) center and is considered one of the top achieving middle schools in the state. Over the past three years (2007-2010), State Pass Advanced scores in grade 7 and grade 8 have risen for all but the Science test: grade 7: English 3.7%, History 0.8%, and Math 13.4% and Grade 8: English 5.6%, History 5.0%, Math 2.9%, and Science -3.0% (Central Middle School Profile, 2010).

Chapter Four reports findings organized by research question and presented by participant perspective. Evidence comes from personal interviews, focus group interviews, and related documents. The intent of this study is to describe Central Middle School’s use of data as a decision-making foundation for continuous improvement of operational and instructional practices in the school. Findings include a brief description of the school staff, evidence related to process, perceptions, and recommendations; and a brief summary for each research question at the end of the chapter.
The purpose of this case study was to examine and richly describe how actions of school leaders influence the use of data within this middle school for instructional improvement. The research questions were (a) how has the principal of Central Middle School made the use of data an integral part of the operations within the school? (b) how has the principal of Central Middle School embedded data analysis and interpretation in the decision-making processes of the school? and (c) how has the principal of Central Middle School engaged teachers in the use of data to promote student learning?

The researcher explored the school’s use of data through personal interviews conducted during multiple visits in February and March 2011. Individual interview participants included the principal, assistant principals, the director of student services, and school-based instructional resource teacher. The researcher also conducted individual interviews with the former principal and former school-based instructional resource teacher in order to provide additional context, perspective, and depth related to the use of data at Central Middle School. The researcher conducted two separate teacher focus groups of collaborative learning teams (CLT); and reviewed documents provided by Central Middle School and from the school and district websites.

Participants

Central Middle School has 4.0 administrators, 4.0 counselors, 84.8 teachers and specialists, 1.0 security staff, 6.5 office staff, and 3.7 instructional assistants and attendants. The former school principal, Nathan, served as principal of CMS from 2003 until his promotion to a district position in 2010. During those seven years, Nathan led the implementation of professional learning communities as well as efforts to implement comprehensive school-wide assessments to guide school-based decisions. The researcher participated in a visit to Central
Middle School in November 2009 related to data use and the utilization of district provided assessment and data tracking tools. At that time, the researcher met informally with the principal, who provided a briefing explaining how data were used to improve school performance. In 2010, CMS received the top award for educational excellence as part of the state Index of Performance.

**Administrators**

Scott, the current principal, in his first year at Central Middle School, had been an assistant principal at two high schools prior to his current position. Christina, Director of Student Services, has been in her position at Central Middle School for seven years, with counseling and teaching experience totaling over 25 years in the district. Alex, the school’s former training specialist and assessment coach, served CMS for five years and was instrumental in the evolution of data use by administrators and staff. Alex is included for descriptive purposes as an administrator within this case study as her role spanned both administrative and assessment coaching duties. Burke is one of two assistant principals (AP) and is the current grade 8 AP. Burke has been in his current position at the school for over 10 years. The grade 7 AP, Lauren, has been with the school for 12 years and has a teaching background with special education experience.

The principal, Scott, provided input and recommendations in the selection of focus group participants and school documents as representative samples of Central Middle School’s teacher engagement in the use of data and decision-making processes. The former principal, Nathan, strongly recommended and requested that the researcher interview the former school-based trainer/assessment coach. Alex worked with Nathan for five years at CMS and was included in
the researcher’s interviews to provide a more complete description of the data journey of Central Middle School.

**Collaborative Learning Teams**

Groups of collaborative learners are culturally embedded as instructional decision makers and teacher leaders at Central Middle School. Collaborative learning teams are groups of adults who work to improve instruction and student learning. CLTs are working groups within the overall professional learning community of the school. These teams are comprised of content-specific core teachers within the same grade level. CLTs are structures that facilitate active involvement in instructional practice; they share teaching strategies and support professional development opportunities. Both focus groups interviewed in this case study were CLTs. Both groups were principal recommended grade 7 core subject teams. One focus group consisted of four science teachers; the other focus group was an expanded CLT of social studies teachers, which included ESOL, special education, and a resource teacher.

As the researcher examined response data collected from seven individual interviews, two focus groups, and specified school documents, five themes emerged. These themes include: (a) data use for school improvement, (b) leadership influences, (c) school culture, (d) instructional practices for student learning, and (e) professional learning and development. Chapter four data are organized by these themes and provides the rich context required to accurately present results of this case study. As noted by Figure 2, the identified domains form the structure and processes that support successful students. A key theme is data use for school improvement and is evident throughout the other themes. There are also various processes, practices, and success factors included within each of the domains. The following are the identified domains and associated processes, practices, and success factors:
1. Data Use for Continuous School Improvement
   a. Context for Implementation
   b. School Improvement Plan
   c. Student Services Plan
      i. Data types
      ii. Maintaining data
      iii. Interventions
   d. RAMP
   e. Resource Management
      i. People
      ii. Budget
      iii. Time
      iv. Scheduling
      v. Technology
2. Leadership Influences
   a. Expectations
   b. Shared Responsibility and Decision Making
3. School Culture
   a. Trust and Respect
   b. Shared Mission and Goals
   c. Values
4. Instructional Practices
   a. Collaboration
   b. Common Assessments
   c. Analysis and Interpretation
d. Innovation

e. Intervention and Remediation

5. Professional Learning and Development

a. Continuous Learning

b. Data-Centric Conversations

c. Capacity

d. Commitment

e. Perceptions

Data Use for School Improvement

Data use at CMS is a school-wide foundational expectation led and monitored by the principal, assistant principals, director of student services, teacher leaders, and specific leadership committees. The use of data is strongly tied to participant position and role within the school. Individual and focus group interviews yielded descriptive data rich with information and personal context. The use of data by administrators and in teaching/learning activities is highly ingrained in the day to day operations of office, classrooms, school planning, and after-school programs.

Scott, the current principal of Central Middle School, is in his first year and follows a principal that led the school on a data focused journey of school improvement. Although the district vision aligned with the goals at CMS, this school, based on the principal’s leadership and philosophy, established a focus and culture of practices dependent upon data as a decision-making tool well ahead of the district as a whole. (SETC Presentation Central Middle School, 2008). The themes and actions identified within this study were established under his leadership and have continued to operate under the leadership of the new principal.
Context for Implementation

As stated earlier, the former principal, Nathan, set a data centric vision and implemented professional learning communities as a foundational structure to support the use of data by staff and faculty. One of Nathan’s main inspirations was W. Edwards Deming’s cycle of plan, do, check, act (PDCA) and the modern revision; plan, do, study, act, (PDSA) as a model for continuous feedback used to identify processes that need improvement (Conyers & Ewy, 2004). Nathan acknowledged his role as the former principal in this way, “this is a pretty complicated business that I think that if I bring anything to the table it’s trying to make the complicated as simple as possible so the people can use it [data] to get better.” Nathan established a cycle of continuous improvement focused on education for students. Nathan describes,

You can systemize around what you already know, okay. In order to do that, you have to have clear metrics by which you’re going to measure the progress that everyone understands and is capable of using in a consistent fashion, okay. And then you use that [data metrics] in a number of ways to make sure that you transfer what’s known, both within a team and within a school and then across a district [based on experience] that these are the things that are delivering the outcomes that we’ve established at the beginning that we want to achieve.

Nathan held a strong belief that a collaborative school environment mirrored productivity in society and was a required support structure in the use of data for improvement and growth. The first metrics that he established were state test scores; these scores were used to create baseline data and to make sure that interdisciplinary teams of teachers began the year with a similar profile of students across grade level teams. Nathan also used data to place stronger teachers with students and teams that could most benefit from their skills. He explains, “So as a
principal, I would take that [groups of students based on state test data] and make sure that those
dots [student scores] started out pretty close together, that I have equally distributed the load
within [teams].” As part of this baseline grouping process, Nathan was able to help address
program needs that were known. He began to use these data strategically to assign what he
believed would be his most capable teachers to areas of greatest need.

Establishing teams with a similar baseline facilitated a measurement process known as internal benchmarking. Student data associated by teacher were compared and monitored throughout the school year. Nathan openly monitored and discussed student achievement by team with teachers, administrators, and faculty as a whole. Nathan explained how he gauged knowledge transfer within teams,

The teams really transfer what they know, if they have relative starting points, then you begin to see the results the teachers are producing with their instructional product begin to compress [scores had less variation]. And as they all collectively get better from each other, you see students achieve and overall elevate [scores rise overall in a similar fashion].

In addition to using state test scores, Nathan set high expectations for the use of data from common assessments by interdisciplinary teams and CLTs. Nathan established Specific Measurable Attainable Realistic and Time-Bound (SMART) goals for teachers and teams based on initial student data points and past performance of groups with similar demographics and achievement data. CMS used students’ previous year’s state test score results to make estimations or predict their future state test scores based on performance of previous students taught by CMS teachers.
Nathan also compared students’ elementary test scores with scores students achieved while at CMS. He routinely organized these scores by core team teacher and subject to monitor his expectation that these scores would increase. Further, Nathan also expected that CLTs would collaborate to elevate their student scores across their entire team. These data were used as a critical indicator of knowledge transfer within collaborative teams, as Nathan explains.

Now the reason that I did that as Deming would say is that now you need to cycle your day towards your goal, okay. So we would begin to deploy common assessments. We would establish a SMART goal. So if our grade level predictive value is 91% pass rate coming in and our top performer of the previous year was 98%, then we would set a goal somewhere between there. So maybe it would be what we wanted to try to accomplish this year is 94%.

If, over time, students under one teacher excelled while students under another teacher did not exhibit similar growth, data provided a focus for discussion about possible explanations. This is one example of data as a tool for collaborative inquiry; CLTs became accustomed to exploring reasons for differences in classroom instruction. Nathan noted,

So if I made sure that those dots [student scores] in terms of relative starting points were compressed and after one common assessment or a series of common assessments, I would see those results begin to separate. The question that I would structure teams to ask themselves [is] what would account for those gaps?

By equalizing and distributing groups of students, Nathan and the instructional staff began to focus on these differences. Over time, this process evolved with a core understanding that differences that occurred in classroom instruction could account for these gaps. It became
accepted that effective instructional strategies were not an individual effort but rather a collaborative team effort. Nathan explains,

So what we’ve found when we did that is the teachers all had strengths relative to the individual standards or the way they taught certain concepts. And we had created a way that we could see the impact of that when we compared our scores across teams. And it gave us a mechanism to drive for transfer. And transfer is actually what delivers the mail.

CMS developed a number of specific processes and data procedures during Nathan’s tenure as principal. The use of specialized data sets and processes became answers to the challenges associated with his overarching goal of getting better as a school in order to achieve increased student performance. He identified the use of data as important to teams in three ways, I think your data set does three basic things for teams. It gives some concept of their relative progress as a team toward whatever their goal is and that’s an important facet. It also identifies gaps in student learning so you can intervene and close them. And it also gives you the capacity to develop your teacher core. So if you look at the data as a reflection of our own work as teachers, then you can use it to get better.

The initial data focus at CMS was on state test scores, as stated earlier. However, over time it became apparent to Nathan that continuous improvement required tools which provided more relevant and timely information, and greater accessibility. These tools included common assessments, a student services plan database, and the processes related to the use of these data, each of which will be explained in greater detail.

Over the past eight years, CMS has implemented and refined several data-dependent processes in their quest for continuous school improvement. These processes are cyclic and
ongoing in nature and encompass the operational procedures of the school. Although there are
many processes and sub-processes that CMS has developed as part of a continuous improvement
model, these processes were organized in one of two major categories for the purposes of this
research study. The first category is the School Improvement Plan (SIP). The district
superintendent requires all schools to publish an annual plan that encompasses their major
achievement and improvement goals. Although a state requirement for schools that fail to make
AYP, this does not apply to CMS or the district in general. The second major category is the
CMS Student Services Plan which is both a process and a comprehensive data tool that drives
instructional decisions and individual student learning plans.

**School Improvement Plan**

An annual school improvement plan is required of every school within the district. The
CMS School Plan Committee and the school’s Leadership Council guide the planning process.
Stakeholders are department chairs, team leaders, CLT leaders, student council and the PTA.
Although some individuals are part of both the School Plan Committee and the Leadership
Council, all subject and program areas have representation and input as part of this process. As
an overview, Scott explains,

> I think our school plan, the SIP, is something that for us really is an ongoing process.

> Certainly in the summertime is when you really start to review a lot of those things. You
do the review, how did the year go, you have [state test] scores but you have other data
that helps you know how the school year went. That data helps drive what you put in the
school improvement plan.

> CMS uses data to target areas of improvement, to justify making changes, and to monitor
the effectiveness of the SIP. Document analysis of the current SIP revealed alignment of the
targeted improvement areas and work plans with instructional objectives. Specific examples of focused instructional activities and practices shared by the CLT focus groups demonstrate this alignment. As an example, CMS identified literacy as a primary SIP objective,

Increase student achievement in all subject areas by ensuring that students develop age-appropriate independent reading skills (including academic vocabulary and comprehension skills) as well as age appropriate critical thinking and problem solving skills, through cross-curricular research-based instruction, systematic assessment, and targeted intervention (School Improvement Plan, 2010-2011).

Both focus groups gave examples of how they worked collaboratively to use consistent vocabulary strategies with students. The Science CLT explained that they worked together to make sure that all grade 7 science students were exposed to common academic vocabulary by using shared lessons and making sure that students understood both word meaning and synonyms used in constructing common assessments. As Lark explains, “Okay, well, that’s fine with me. My kids know both, and we’ll change it so the vocabulary won’t trip them [students] up.” Kylie, grade 8, explains, “We all focus on the same vocabulary words. We found that helps the kids the most.” Preston “We can give word walls that they’ll put into their notebooks and we identify key vocabulary. And actually we worked with seventh grade to do some vertical articulation this year of words that they need to know heading into eighth grade.” Carmel explains how vocabulary affects assessment of ESOL students, “So what we’ll do is sometimes I’ll take that test and I’ll put it in plain English or give them some additional vocabulary support. We have the kids using dictionaries with it now which I don’t know if they were before.”

At CMS the school plan is valued and used as a foundation for implementing ongoing school improvements. References to work plans contained within the SIP document were
evident throughout the interviews. Scott illustrated the value of the SIP within CMS when he shared,

I think, honest opinion, everybody is doing the things in the school improvement plan…. we are doing all the things in the school improvement plan but I think if you asked teachers what is in the school improvement plan, they would struggle to tell you. We have given them a summary of it and a breakdown of it. We had a lot of people involved in developing the school improvement plan; it was a panel of about 20 of us and a mixture of everybody across the board. But unless you are really involved in writing it, you may not know exactly what's in there, but they are doing it. That's the important part, but depending on who you ask you might not get someone that can tell you very well. They would tell you what the three goals are and maybe some of the work plans. They don't know the details of the plan document because it's not important to them but they are doing it.

**Student Services Plan**

Beyond the district required SIP; CMS developed a comprehensive data centric planning process which drives school decisions and actions. The Student Services Plan (SSP) is an umbrella process which encompasses several cyclic sub-processes which fuel decisions and activities at CMS. The main sub-processes are: (a) master schedule construction; (b) student placement; (c) program decisions; (d) interventions for students at risk of failure; (e) hiring; (f) resource allocation; (g) teaching team composition; (h) professional development; and (i) action plans. The SSP, even more than the SIP, drives everything that happens in the school.

CMS has developed a specialized database to support the Student Services Plan (Figure 1.). This database has evolved over several years and combines standardized test scores and
localized student data. Scott explains that prior to his arrival, CMS came up with a system that really helped leadership and staff focus on and use data well within the school,

They developed a student services database which is very comprehensive. It really looks at every student in the school; it looks at the student before they ever walk through the doors of CMS. We are gathering test data from our [incoming] sixth graders now and putting it in that database, so that in the summer, one of the things teachers come in early for [on days they don't even have to report], is to look at the data of the incoming sixth graders. [This] … gives them an idea of what they need to do for that individual student.

Christina, DSS, explained that the database which supports the SSP was originally a simple Excel spreadsheet, “The spreadsheet was created for use by the guidance counselors because we were frustrated with the fact that we had so many different electronic sources of data.” The information that counselors considered essential was located in four or five different places and tools. Christina sought a solution that allowed counselors to see all relevant data within the same view as it related to each student. The school-based instructional resource teacher did the technical work and designed an Excel spreadsheet. After the spreadsheet design was final, counselors manually input additional data and information to fully populate the spreadsheet.

Over time, the spreadsheet was refined. Christina elaborated,

…this became a wonderful tool because we had it all in one place. Given our population and what our school plan was and our objectives, what we wanted kids to achieve, how we wanted them to succeed, how we wanted to prove that they had success, we had the actual results of it [school plan].

This tool was embraced, first by the guidance office and administrators and later by CLTs. Christina attributed the accepted use of the tool to the utility of the design “that made it perfect
because we designed our student service plan to look at, what we think our at-risk factors are, and what we think our success factors show.” From the initial implementation of the SSP, CMS began to establish metrics replacing perceived success with empirical data. Christina explained “We came up with a scheme and knew, okay this worked, and this didn’t work. This is how we’re going to change”. The evolution of the SSP and the database illustrates the plan, do, study, act, which is the foundation of the school’s continuous improvement philosophy.

The database includes standardized test scores for state tests, SRI, Iowa Test of Basic Skills (ITBS), and common core assessment data, but it also contains attendance and discipline data. Counselors and teachers stay aware of attendance and discipline data as indicators of the emotional well-being of the student. Administrators and counselors consider this information important for all students, irrespective of their grades. The data included in the SPP database goes beyond end of year test scores; it presents a more complete picture of each student’s current state and progress since the database is updated throughout the year. Christina states,

So we’ve had the student service plan for about three years now and it’s become our right hand. Because we do have all that in one particular place and it also has focused us to look [at the data] eight different times a year, we populate that with all of these different reports and assessments.

**Data types.** Several types of data are represented within the SSP, standardized test scores, formative and summative assessment, attendance, club and activity participation, discipline, grades, and demographic information is included for each student. The counselors collect and analyze perception data from a student survey of counselor activities and interactions with student groups. This information is important to the programs that CMS and the guidance office are building. There is an accepted practice of collecting perception data (survey). These
data are used to formulate activities, programs or enact change at the school. Survey results are also used to examine and evaluate success. Christina explains it as a process.

So we seem to be using it all. And it’s just kind of circular type of thing, you know.

Student records are continual demographics, but as you put a new program in place, we are really exemplifying the fact that we are starting with this [data] and here is why we built it this way, this is our perceptual data. This is what our perceptions are, pretest and posttest. These are the results.

The convenience of a single source allows the guidance office and administrators to filter views of data based on particular criteria such as school plan, test scores, and common assessments. The ability to easily manipulate data views is highly valued at CMS.

The Student Services Database has pages of information. CMS includes all the state test scores since this is the major standardized assessment used in the district and at the state level. Students are identified by a unique ID number. Information is viewable by category, which includes grades by quarter and interim, attendance, and discipline data. Christina explains, “attendance because we do know that attendance affects school success.” Assistant principals add the discipline data; they are the most familiar with any discipline data related to individual students.

**Maintaining data.** Data contained in the SSP are useful because they are easily accessible and comprehensive with regard to the information that is important to student success. However, if data are not kept current, they become less and less useful over time. Some of the data elements are easily exported from a centralized student information system. Other data must be manually added or imported from individual sources. CMS had to come up with a method for routinely adding data. CMS counselors put in all of their students’ grades that drop below a certain point; this includes interim grades. Counselors create and maintain their own
anecdotal notes and include their meetings with students and parents within a restricted area of the tool. Attendance personnel and school office clerical staff enter some of the data. This activity is a scheduled division of labor, which occurs during teacher workdays, and during the school year when the school is less active. Information in the student services plan is updated eight times during the year to coincide with interim and quarterly report cards. The collection of data (Figure 1.) within this tool forms the basis of the student services plan.

**Interventions.** The SSP includes a data sheet for each student at CMS. Accommodations and interventions for specific students are identified within the data sheets. Christina explains, “We have a whole other filter with what we’ve accommodated or our interventions we’ve designed of which we have so many.” These interventions may include data related to student participation/attendance in after-school programs, homework club, or various tutoring opportunities. Students at risk of failure may be identified for targeted interventions at any time of the school year, but these identifications are most prevalent early in the second semester.

The director of student services is responsible for overseeing necessary changes to student and staff schedules. The implementation of specific remediation plans for identified students relies on significant class schedule changes as well as changes in teaching schedules. Scott explains,

> We are moving kids into Power English and Power Math, which are smaller classes. We have also moved, for instance, our eighth grade math 7 class, which has a lot of struggling math students, and we've put two math teachers in there together now. We have moved the teacher schedule so that she can be in there with those struggling students; therefore if one of them needs to take out a small group to do some quick
remediation, they can do that. We moved another special education teacher into a math class 6th period, another math 7 class, because there were more struggling kids in there. So we really develop concrete remediation plans based on looking at that data, and saying this kid needs more support here, they need more support there. This time of year we are moving kids all over the place.

Mid-year schedule changes are decisions based on many types of data, not just grades. Administrators and teaching teams look at student attendance, how students have performed on common and formative assessments, participation in activities, and completeness of homework. Christina states, “I just had 150 changes, so we’re willing to manipulate our schedules to meet the needs of the kids.”

CMS defines students at risk of failure in a specific manner. Christina describes these factors,

In our school, if a student slips below a C, we look at it. If they have an …[a state test score] that is in a low range or fails, SRI, we put the reading scores in there and then we look across at that student, we’re able to pull one student’s data out and look holistically across.

The SSP data is heavily used, the data tool used at CMS is a way of easily accessing the information and avoiding accessing multiple sources or duplicating effort.

Interventions range in intensity. If students require focused instructional remediation, they are sometimes pulled out of elective courses. Scott explains,

We do take electives away from students, simply because they do need support in English, math, science, whatever it is. We have hired some retired teachers to come in
and pull kids and remediate them during the day. We try not to take them out of their [regular] academic class so we try to find a time when they can do that [remediation].

**Recognized ASCA Model Program (RAMP)**

A strong relationship exists between principals and guidance counselors at CMS. This is particularly true of the relationship between Scott, the principal, and Christina as director of student services. Evidence of this relationship is illustrated as they both describe how the coordinated use of data positively impacts both academic success and the emotional well-being of CMS students. The American School Counselor Association’s (ASCA) Recognized Model Program, known as RAMP, is a framework and certification designation for school counseling programs. RAMP is based on the ASCA national model of foundation, delivery, management, and accountability standards to support program evaluation and improvement benefits to students and the counseling program. RAMP includes specific references to accountability and responsibilities. RAMP certification criteria require data collection and evidence for the following 12 components: (a) statement of philosophy; (b) mission statement; (c) school counseling program goals; (d) competencies and indicators; (e) management agreement; (f) advisory council; (g) calendar; (h) classroom guidance curriculum – action plan and lessons; (i) classroom guidance curriculum – results report; (j) small group responsive services; (k) closing-the-gap results report; and (l) program evaluation reflection (ASCA, 2012).

Scott and Christina each made specific references to the effort at CMS to attain RAMP certification. Scott elaborated that RAMP has become in vogue over the last two to three years within student services.

Really, it's data for them to make decisions and we are going to be applying for RAMP and hopefully we will be recognized for qualifying as a RAMP school and it's a national
certification. So I think you can't forget about student services and what they are doing and they're not necessarily just looking at student's academic scores. They are looking at students’ emotional, social well-being, but they are looking at data about that. How many discipline referrals do you have? What's your attendance like? Are you seeking out counseling for whatever reason within the school? I think that the data they are looking at helps them make good decisions as a group for setting up things. They have a couple different groups that meet and it isn't really about academics is really about identifying kids that are at risk, not necessarily of failing but at risk of perhaps depression because things outside of school, family life is really impacting them, if they have lost a parent, if their parents are going through a divorce or separation. They have their lunch clubs and they meet, a lot of that is based on data to identify students.

Christina reinforced Scott’s explanation of how students are identified for interventions and services based on data. She highlighted that her counselors are using the ASCA Model and that they are applying for RAMP.

They are actually designing programs, they started right off with a group [of sixth graders that would be coming to us in the fall for which] we had data, we did not even know the students yet but we put together a group we call a fresh start group. The fresh start group focuses on study skills and on test taking. CMS counselors worked with this group to transition them successfully from sixth grade to seventh grade. These students receive mentoring and reinforcement to make sure they start off strong in the new setting. Christina is passionate when she states, “This came all out of just reviewing two months of records and spreadsheets.”
Christina has been instrumental in implementing the ASCA model with an emphasis on the use of data at CMS. She explained the value of the framework supported by data. The value of the ASCA model is recognized at a local school level and has been adopted at a state level. Christina explains,

It’s been very satisfying to be part of the ASCA Model, the middle school movement, being a counselor background. I’ve been a part of that for about the last six or seven years. The ASCA Model was developed about 2002, but it’s just the whole idea of a data-driven comprehensive credible program. Not just based on “Ah, that looks like fun,” you can actually say “This is what you should have,” and the data supports this.

**Resource Management**

Interviews of CMS administration and CLTs demonstrated strong understanding of relationships between resources and positive instructional outcomes and deliberate decision processes about how to best use available resources. Both former and current principals expressed their need as leaders to identify and provide adequate resources to help overcome common implementation barriers. Nathan shared barriers he encountered when implementing common assessments and looking at student achievement identified by teacher,

Some of those things where you would get obstacles and push back, like we don’t have time to do what we don’t really understand how to do it. We don’t have the technology to do it. So, over the course of time, we would pay attention to those as opposed to using that as a reason not to pursue it.

Scott echoed the importance of resources as a strategy to offset or remove barriers, “I think the most important thing for me to do is give teachers the resources they need to be successful.”
All participants identified resources as critical to planning, instructional decisions, and student success. The principal identified relationships and dependencies between these resources and subcategories as typical within schools and commonly identified by other school administrators. For the purpose of clarity, resources are organized into five subcategories; people, budget, time, scheduling, and technology.

**People.** Both the former and current principal identified people as their most important resource. Scott communicated that he felt CMS had many good resources, but that his first focus is on people who include staff, faculty, students, and external resources,

> Our biggest resource is people, because once you look at the data, it's great, but if you don't have a teacher there with the kids, or a retired teacher or someone there to actually implement what they need, then it doesn't mean anything. So the biggest resource is people and moving them in the right places and putting them in the right place for kids.

Nathan identified a specific concept of resources within a team as the first step for improvement and determining what everyone in that team knows (internal benchmarking) as a foundational resource. Scott explained that CMS uses external resources to augment intervention strategies recommended by teaching teams and as substitutes to provide teachers specific planning and staff development.

One example of external resources is retired teachers, who are hired to remediate students with identified deficiencies. These resource teachers are hired based on their content area specialty for a duration of time dependent on the needs of the students. These data-driven hiring decisions are based on analysis of assessment data and the formulation of individualized student remediation plans. Scott describes the importance of data in determining appropriate resources,
I think the most important thing that we need to know as educators is who are our sixth grade students that are going to be coming to us and what do they need. That's the information we need, and once we have that information and we can sit down and look at that information, then we can develop plans to help them. I would say that that's the most important thing really for us to be successful. To know who's coming and what do they need. Once you can get to that point that you understand who they are and their deficiencies, then you develop a plan. Then you can put your resources, if that year you need more help in English, then you can put your resources into the English area. If it's science one year then you need to be looking at that so I think that's really the key, who are they and what do they need. The earlier you can get that information the better, that's why knowing your feeder schools and having a relationship with them and doing some vertical articulation is really important. We do [this with] all of our feeder schools and we give the SRI [tests at the] school, we do that to our [incoming] sixth graders because we want the information.

The school web pages, during the study, strongly reflected the importance of people within the mission of the school. The overall mission statement included sections specifically for faculty, students, parents, and prospective employees. References to the importance and use of data were clearly emphasized as integral to the school’s hiring philosophy (Central Middle School Webpage, 2010).

The previous principal, Nathan, expressed his view of the importance of people as one of the critical structural resources from a philosophical perspective. His view of structures to support continuous instructional improvement is based on Deming’s model of plan, do, study, act (PDSA). He explained,
It doesn’t have to be a PDSA model like that Deming might, but all this stuff is the same in thinking. I mean Sengay's piece is, OK what’s your current reality? What’s your strategic intent? That’s where you want to go and then what are you going to close the gap with? It’s always going to be people, resources, strategies, time, and personnel. It’s going to be one of those things. So what’s your theory about where your current reality is and what you are going to close it with?

The instructional resource teacher (IRT), Alex, was instrumental in developing and implementing the SSP data tool and establishing the culture of data use by teachers. Although the strong emphasis on data use was instigated and led by the former principal, the combination of Alex’s technology skills and strong collaborative relationship with Nathan set the foundation for the acceptance and use of data that is highly evolved and continues under the new leadership of the new principal. Alex explained how her relationship with Nathan evolved,

I was with [Nathan] for five years. So we’ve really developed that whole system and we really developed a partnership. Some of the most simulating kinds of conversations that we had were the ones where we were debating what data to use and how should it look. Because we were making decisions for teachers about how they were going to see the data. We would go back and forth constantly. So it was not always an easy process. But I think, because we had an open working relationship, we’re like, okay, he knew I was going to be completely honest with him. If I thought it was bunk I was going to tell him and he would tell me the same thing.

I think that’s also critical when the people working on something kind of are okay with, let’s have a conversation about the hard stuff. I disagree with you and this is why.
But still have a mutual respect for each other. And that’s also, key and that you can’t really measure.

**Budget.** CMS uses budget resources for identified needs such as shortages of personnel for instructional interventions, subject matter expertise, or to introduce more instructional flexibility within a limited school day. Scott explained how budget is used to fund a specific instructional opportunity for incoming sixth graders,

Budget wise, I'll give you an estimate; I think a pretty good estimate, with our remediation programs and extra help. If you count some of the stuff we do in the summer, when we look at the sixth graders in our database we invite them as incoming seventh graders to come to our jump start program which is a two week program. If you count all of those programs in the summer and bringing in people to help remediate, we probably spend close to $20,000.00 on remediation. It's quite a bit but I think it's a good investment and I think it has paid off when you look at scores of 100% and 99% it's working. So you don't really want to change it too much.

**Time.** Participants frequently cited adequate time as a critical resource required for data use, analysis, planning, and instruction. The principal, administrators, and staff have implemented strategies to conserve and preserve time for these activities. In some cases, time is created by expending budget to hire substitute teachers; this offers opportunities for planning activities that might not otherwise be possible. Nathan identified insufficient time a barrier to implementing common assessments. His explained his approach to overcoming this barrier, “Okay. Let’s figure out a way about how we can provide time for what do you need. We used some strategic resources like sub resources, hourly money, technology purchases, [and] key purchases.”
The current principal also identified time as a barrier to the use of data; however, his explanation of his role and approach to reducing this barrier also included time management practices that CMS has adopted. Scott acknowledged teachers’ needs,

Sometimes they [teachers] ask me for substitute time to plan and that's really legitimate. You know we are asking them to be in these teams and do all this work but they don't have enough time sometimes to do their planning for their own classes, so time again [is an important resource] if you can provide them a resource of time, I think that is important.

Scott also elaborated on how he has implemented practices across the school to conserve time and set uniform expectations for meetings,

I think, sometimes the biggest resource I can give them is time to do what they need to do. So, I have really tried to figure out ways to make the schedule effective for them, so they are not wasting time. So, if we are meeting for something, we have really strong norms here for every meeting, we have an agenda with norms. We hold to, for instance, if we are going to talk about something for ten minutes, once ten minutes is up, we stop talking about it. I think one of the biggest resources I have tried to provide them is time.

The implementation of this meeting agenda strategy was identified by the science CLT focus group. As part of a discussion about how the CLT’s use of time had changed using common assessments and strategies, Lark explained,

We meet, and [Carla] has an agenda, and we’re pretty good about sticking to the time. You [Carla] even put time limits on things this year. It’s supportive, because we know that there is going to be an agenda, and we are going to accomplish those things, and if
we don’t … We’ll put it on the next agenda and we’ll still get it done. You don’t just ever let things go away.

Scott demonstrated recognition of the effort his teachers put forth and empathy for the energy required to do so. Scott shared,

I have always been very cognizant to protect their time, to give them the time to do what they need to do. I do think that they get tired and burned out, teaching is a very hard job, it takes a lot of energy. I think you need fresh teachers who have the energy it takes to get the job done. So that time factor, for me, is a big thing.

Interventions are heavily time dependent and are constrained by the length of the school day and physical space. Shared teaching strategies, such as rotating students between teachers who specialize in teaching particular concepts exceptionally well, still take place after school due to time and space constraints.

**Scheduling.** Data form the core information used to construct the master schedule, which drives the CMS instructional program. Nathan explained the importance of the master schedule as it relates to collaborative use of data, “If you believe this is collaborative work and you want to have your teams engaged in a process like what I just described to you, then your master schedule has to reflect it.”

Activities related to incoming students begin early in the second semester, as soon as information about incoming students is available to CMS. The guidance office looks at how to build the schedule to best meet school needs for the upcoming year based on demographics, prospective numbers of incoming students, the types of programs offered, student course requests, and special programs.
Information and data about incoming students are used to build a schedule that best utilizes the talents and skills of the teachers in the instructional program. These programmatic and scheduling decisions are based primarily on data. The administration carefully considers decisions about the master schedule decisions and makes these decisions collaboratively. Christina, director of student services, describes the decision-making process which occurs when the administration meets together,

Before we even make a major decision, we bring everything together and look at it. That’s what I’m doing right now with our principal, looking for next year. Because we know with the rising numbers of open honors along with gifted, which equals about 60, 70%. How do you make a schedule that meets all the needs of your at-risk students? So we know that we need a different configuration. And we’re basing that solely on what has worked, you know, looking at it, but also the data, the type of student that’s coming and what our percentages are going to be and so on.

Data are used at several times before and throughout the school year to identify and implement the master schedule, but also for scheduling individual students. Creation of the master schedule and initial placement of students is only the “first cut” on using data for these decisions. As the year progresses, teachers and administrators take a “second cut” look at data for patterns in grades, reading scores, discipline, and performance to monitor placement. Alex elaborated,

We didn’t want a kid who was weak in math to have math at the end of the day when middle school kids are tired. I mean, those were the kinds of decisions we were using, to drive that… predominantly at the beginning were looking at good placement decisions. In the middle of the year, we’re looking at progress throughout the year.
A “third cut” of data is used to identify any major modifications or schedule changes that might be recommended to increase student success. This review occurs prior to looking at practice state tests or practice summative end-of-year tests.

Technology. Participants in this study identified several technologies they used for assessment and as student data sources. Although they made references to state reporting, student information systems, and standardized test providers, the two major tools commonly used, and frequently referenced by administrators and teachers, were the District Formative Assessment System (DFAS) and the CMS Student Services Planning tool.

CMS was an early adopter of the District Formative Assessment System (DFAS). This system provides district-approved assessment items organized by curriculum standards, benchmarks, and indicators and district benchmark exams for core subject areas. The system is web based and provides options for on-line and paper pencil assessments. Results are accessible to teachers immediately for on-line tests and within two to three days of processing the paper pencil assessments. This tool also allows teachers to create their own assessments of student learning and provides links to approved curriculum resources designed to strengthen instruction of specific content. District-mandated student assessment benchmark results, and assessment frequency by school, are reportable via DFAS and are available to principals and top level district administrators.

Although both the former and current principal identified technology as a resource, Nathan voiced a much stronger value in technology as it supports the use of data for instructional improvement. Nathan also expressed his belief that technology support specialists have important leadership roles within the school environment. Scott offered a value statement in reference to technology,
Technology is great and it's a great tool and the [district assessment tool] is certainly something that we use and the other resource is the database I was talking about, the student services database. But our biggest resource is people, because once you look at the data, it's great, but if you don't have a teacher there with the kids or a retired teacher or someone there to actually implement that they need, then it doesn't mean anything. So the biggest resource is people and moving them in the right places and putting them in the right place for kids.

Curriculum teams, counselors, and administrators use the student services plan tool to collect and track defined student data elements and monitor student success on assessments. Teachers use defined Excel spreadsheets to track and monitor how well the students are doing and to identify students for specific intervention and remediation. Data include grades, test scores, attendance, discipline, interventions recommended by academic teams, and positive behavior points (see Figure 1). Scott also uses these spreadsheets as a data wall when he meets with teams to review student progress. CMS uses a large, wall-mounted monitor in the principal’s conference room to display data during their planning sessions.

**Leadership Influences**

Participants demonstrated strong accountability to sustained student learning, professional learning, and school reputation. The theme of accountability emerged across participant interview responses. Participants responses about leadership influences related to their use of data and student learning, were concentrated within three categories; leadership expectations, decision making, and analysis and interpretation.

**Expectations**

Participants validated Nathan and Scott’s expectations of APs, the DSS, and instructional teams, throughout the interviews at CMS. Interview data included numerous references to
expectations set by both the former principal and current principal. Participants also highlighted subtle changes in those expectations by their new principal, Scott.

Scott expressed a strong expectation that core academic teachers are involved in data all the time. He shared that this expectation extends to physical education and elective teachers, but to a lesser degree. Scott specified, “I would certainly say that the expectation for core teachers is that they are engaged in looking at data weekly and analyzing the data whether it's [common, formative, summative] assessment, it's the database, whether it's SRI [standardized test].” The district-supplied assessment tool focuses on core academic areas. Elective teachers are less involved in working directly with common assessment data, but it is Scott’s expectation that they participate and support these efforts to achieve school-wide goals.

Principal leadership at CMS sets expectations, monitors progress, and provides support to remove barriers for teachers and staff. Scott explains his leadership role related to setting expectations, providing resources, and monitoring results and progress,

I've put pressure on them to continue using data, to have those difficult conversations with one another. I think a big part of my role is to get in there, to get into the team meetings, to get into the collaborative team meetings and be talking about instruction and our best practices, but then really listening to what they really need. I think that each one of the administrators and the director of student services have been people that have guided them [teachers/teams] sometimes, but I think that at this point, really into their fourth year of using data, they are pretty good at it themselves, they don't really need us any more, don't tell anyone that, but I'm not sure they really need us that much. But what we do to help is to always be checking in and truthfully, we are kind of the pressure. Are you doing it, are you meeting, are you using it [data]? Just by being a presence at the
team meetings, I think that sets a tone. Also talking about data in our faculty meetings, every faculty meeting I talk about data. I spend at least 10-15 minutes looking at data whether it's benchmarking off another school on how we did and how they're doing.

Assistant principals confirmed that they actively participate in grade level team meetings and in PLC/CLT meetings. Lauren and Burke perceive their participation as instructional support, both APs expressed that this is an expectation of the principal. They both independently articulated examples of their own expectations and responsibilities as well as how they guide and monitor teams. Lauren explained,

As assistant principals we participate in team meetings. We participate in the PLC meetings, so we have a pretty good sense of what’s going on and we work closely with guidance. I know I work closely with guidance in making sure that students are getting the support they need. So, we certainly encourage the teachers to continue creating opportunities for students to learn. I support [students] with my boot camp.

Data use by faculty identifies areas of weakness, but also maintain the high expectation of all students, as Lauren explained,

I think it [data] helps them [teachers] keep their expectations high for those students. When the PLCs get together, they’re looking at the scores on common assessments, they’ll look at those scores for the ESOL and the special-ED, and the expectation is that every teacher is responsible for those students. It’s not just the ESOL teacher or the special-ED teachers.

Both AP’s expressed that expectations, set by the previous principal, still shape the use of data at CMS. These expectations formed a foundation of data use and are still in place with the current principal with subtle differences. Burke shared his perspective set by the previous
principal Nathan, “you’re like a microscope and you develop, you devise a lens where we constantly hone in on the data and this helps us identify things that we didn’t really notice.”

Burke attributes the regular discussion and sharing of data to the foundational practices put in place by Nathan. “So, and I think that’s where [it came from], we do a lot of that during our admin meetings and during our leadership meetings and then of course we share this data with the teachers at staff meetings.

Lauren explained,

It’s a little bit different because we have a different principal this year. I think Nathan … would meet regularly as an admin and say, ‘Okay, so what are your teams doing. What are your PLC’s doing? What are we doing with the assessment? How are kids doing on the [common] assessments?’ And the expectation was we knew that.

There is a continual expectation that everyone uses data, this includes teachers, counselors, and administrators. Lauren elaborated, “It’s not just the core teachers. Everybody is looking at setting high expectations and finding the ways to get there. And data is one of the ways.” Burke corroborates Lauren’s perspective,

Our principal has constantly emphasized, you know, the performance level of all our students in the building and all of our teachers. And we are constantly looking at information to enhance our school, enhance our data outcome in the future. And this process is always ongoing. It’s ongoing in our team meetings, administrative team meetings I’m talking about, as well as extending this type of way of thinking with our teachers and that you know, and especially during our staff meetings.

Administrators shared consistent views and perceptions related to what was expected of them by Scott. They also consistently identified how, where, and when opportunities to use and
share data occurred within their responsibilities at CMS. Burke identified leadership meetings, team meetings, CLT meetings, and faculty meetings as times and places where information and data is presented and discussed. Christina corroborated Burke’s statement when she added,

> We have, of course, our different department meetings and administrative team. And we have a school leadership team that meets. And that’s in addition to the PLCs that meet. And addition to the team leaders that meet. And so we have a hierarchy of how things are addressed and discussed.

These groups provide opportunities to solicit teacher leader input. Burke highlighted his understanding of the purpose, “Scott always presents something data related that we need, that we need to focus in on. Try to enhance our teacher’s performance as well as the overall performance of the students.”

CLTs provided numerous examples that demonstrated their understanding of expectations placed upon them by the administrators. Examples they shared were consistent regarding their understanding of expectations to use data. They also provided examples that demonstrated differences between the previous and current principals. Carla, science CLT leader, stated “the previous principal definitely had expectations …that were very concrete, like you must implement or deploy so many [common assessments] tests a quarter.” Lark, the newest teacher in the Science CLT shared her impression of how expectations have changed,

> I think probably when Nathan was here, I was only here one year with him, but it was data, data, data. That’s what every faculty meeting was about. That’s what anytime we talked to him about anything else, it came back to data. And you got the very strong impression that you should be looking at it, and that he’s looking at it very closely….his
[new principal] support staff feels the same way, that we should use it [data], but I think he’s given us a little space to be someone different from the previous principal.

CLT members consistently expressed that expectations placed on instructional practice to improve student learning remain high, but teachers felt less pressure to focus on data by the current principal. Kylie, from the social studies CLT highlighted,

I know when Nathan was here if he stopped by, he would actually write a letter just saying, “Hey, this is what I saw.” Lauren does the same thing, our assistant principal. She comes in and observes. Usually hers is a little bit more formal. But at the same time it’s just kind of, “Hey, I want to see what you’re doing.” And she’ll come and participate with the kids and then just kind of write a summary of what she saw and what she really liked and what was working. And then with our principal now it’s kind of, “Hey that was great what I saw.” Or “You might want to check out these kids who are here. This is what you can do to help this group over here.” So a little bit more informal, but very frequent.

Science and social studies CLT focus groups agreed that expectations related to data use, common assessments, and student achievement remain in place with the current administrators. Lark shared, “I think they [administrators] give the strong message that they do expect common assessments.”

CLT teachers clearly believed that a decline in student achievement would result in renewed pressure from administrators. Science teacher Lark stated,

I think they would be more involved if there were problems, or parents complaining, or not getting the results we need to get, but I think they’re seeing that it’s working. Don’t mess with it. They assume that we’re doing what we’re supposed to be doing.
One example of circumstances in which teachers would expect increased administrative pressure was cited by Preston, social studies CLT leader, as he explained how maintaining high test scores is foundational to innovative teaching. Preston elaborated,

So I think we do look at the data and we do struggle with that because we’ve kind of been held to the fire on it. But we’ve also done really well on it. So that gives us a ticket in a way. And the way that I would explain it is a lot of schools consider the state test their Super Bowl and if they get 100% or whatever number they’re aiming for, they win the Super Bowl. For us, it’s a ticket into the playoffs because if our kids do well on that, then we can do all the fun stuff. If all of a sudden we had a 50% pass rate, we’re going to have to put away some of that stuff for now.

Preston associates effective instructional use of data and positive results with increased administrative trust. “We’ve done well, so much so that I think we have that trust. Had we slipped or our reputation changed, then I think that would change our answer to number eight [principal’s expectations related to use and analysis of data].” As an example Preston explained, “There was a year that we didn’t make AYP because … a small subgroup didn’t make it. So that I think, ratcheted up the focus on data with our former principal.” Damon confirmed, “I mean the year that we didn’t make AYP, there was a lot of more data and we have to pass this and that sort of thing.” Preston added another dimension to the conversation by pointing out that increasing student achievement is important for both students and teachers at all levels. Preston stated,

I think we’re more proud of the pass advance [sic] rate because it shows that they’re getting it beyond just the surface level. And so now that we know that we can’t take a
step backwards because then that could affect all the smoke and mirrors and fun and games that we do the rest of the time.

Participants in both CLT focus groups shared their impressions of how administrator participation in CLT meetings had changed with the arrival of the new principal. Their perception was that administrators attended their meetings less frequently but that expectations were still in place. They felt fully supported by the administration. Carla explained that the expectations were based on what the previous principal had put in place. She described the current situation by saying,

Keep doing what you’ve been doing and everyone’s sort of still doing what the old principal required of us, and so we’re all just continuing to do that. But I don’t know that it’s necessarily a direct, you know, rules or guidelines that have been specifically stated.

Kelvin interpreted less frequent administrative attendance at CLT meetings positively when he explained,

You see, it’s not that we don’t want them [administrators] involved, it’s just—I think it’s nice that they recognize that we come in; we do what we’re doing. We’re experienced at what we do. We’re getting the results that everybody wants to see. And they know that we’re constantly innovating all the time.

Kylie explained that under Scott, the new principal,

Expectation is communicated to us through Preston. That’s a big part of it as our PLC leader, department chair leader. He’ll just kind of say, “Okay, guys this is what we need to do.” Faculty meetings, expectations are always brought up in the faculty meetings. Data is shown to us in the faculty meetings. And just through observation: the assistant principal comes in to see us teaching. Then we’ll get a whole write-up. Or if principal or
whoever happens to come in and sees us teaching, typically we’ll get a letter back or the official [teacher evaluation] paper if you’re in your [formal evaluation cycle] years that basically just says, “This is what I saw. This is what I really liked.”

**Shared Responsibility and Decision Making**

Although the principal sets expectations by communicating goals, expectations, and progress on targeted areas of improvement through faculty meetings, leadership council, and through the school plan, participation in instructional planning, decisions, and practices is a shared professional responsibility. Scott explained,

I would say everyone has a voice here, certainly the PTA, the parents have a voice and I've shared a lot of data with the parents. I would say that our teachers certainly have a voice through leadership council, so I would say it's shared. Remediation decisions are primarily made by teachers, particularly when defining which students need remediation. I'm a part of [this] and the director of student services is involved in getting those plans into place, but the teachers are really the driving force of identifying the kids.

Both assistant principals provided statements and examples illustrating shared responsibility in decision making and in leadership. Burke shared his perspective on how decisions are made at CMS,

We share team decision making … [in] our leadership meeting, monthly meeting, we talk about not individual students, but we talk about particular weaknesses that we noticed overall, across the board. And would [not] always come out with complete resolutions but … we set aside a group of people to look at something and then they come back and report to the committee and … they give us options and we decided … what is the best approach to take regarding … the type of data or concern that we want to resolve.
Carla, the science CLT team leader, felt that science teams were cohesive at CMS even before the emphasis on data really started with the previous principal. Carla shared,

We’ve never really had, you know, the teacher—the lone wolf teacher going off and doing their own thing and no one knows what they’re doing. But over the past several years, there has been an added emphasis in looking at data and analyzing data and that has been a trend over the past—ever since Nathan came.

One example of these expectations was provided by Lark, a seventh grade science CLT member. Lark shared that when she was new to the subject and the team,

The meetings were more of, this is what we’re doing, and to make sure you knew the standards of [the state], and what was expected to be taught in that lesson. You don’t go too far offtrack and do your own groovy thing. And I think that was the focus of last year, the last two years, and now it’s come more around to improving and growing as a group.

Lark, expressed that data is helpful in validating instructional effectiveness in the classroom,

[Data] kind of helps us see what we’re doing right, too, which is kind of gratifying to see, because our kids do well overall. So it kind of makes you feel like, okay, especially as a new teacher. It’s comforting to me to look at the data and say, oh, well, 90% of my kids passed. They have decent grades. So then you can target the ones that didn’t. But definitely, it’s been reassuring.

Scott expressed his expectation that teachers use data to drive decisions and exhibit instructional uniformity and cohesion within CLTs and teaching teams. He explained,

We all need to be the same; we all need to have the kids up at 95%-100%. If you look at our [state test] scores last year, 100%, 99% on all tests and it's because of the honesty,
looking at data and being able to say "if you're on my seventh grade collaborative team, even if your strength may not be teaching fractions, we are going to help you with fractions because all of these kids are ours.” And all of that data at the end of the year belongs to everybody, so we have to compress everybody. Elevate and compress, elevate and compress! So there's a really focus in this school and I think data has driven the focus. They have also been provided a tool.

Individual teachers shared specific examples that demonstrated awareness of professional responsibility and ownership of student learning which extended beyond their individual classrooms. Kelvin elaborated,

If there’s an issue with a particular… assessment, or even a particular student, if we don’t take care of that right away then that student’s going to get lost somewhere with that information for when they do have their state test in eighth grade. That’s going to be something that is passed on. But also, just for our own satisfaction and peace of mind, we’re making sure that the students have everything that they need to go on and move on.

The former principal, Nathan summarized how CLT ownership of decisions about data use and instructional strategies evolved at CMS,

So each team then started to have their own kind of little strategy in what they wanted to focus on. So it wasn’t like I drove something out school-wide although we did some things that were [a] school-wide focus. But for the most part as this evolved, it started to become CLT focused. And they were driving their own bus as to how that worked and that worked.

Shared decision making is a part of the school culture at CMS and appears resilient to the recent change in leadership at the school. Teachers are experienced in the use of data and have
experienced successful results. Lark articulated her explanation about why teachers continue to use data even though they perceive less administrative pressure to do so,

… I don’t think everybody did it [used data] to please Nathan, either. [They] saw the point of it and they saw the test scores go up, and they saw achievement go up. So I think everybody’s doing it now because it works for them, and helps. So everybody does it because it works.

CLT participants appeared to have internalized these expectations and cultural values. School leaders continue to influence data use behaviors, but expectations are not explicitly stated.

**School Culture**

Central Middle School exhibits a positive faculty culture that is strongly supported by the administrative team. CMS has high expectations for learning and achievement for faculty and for students. Responsibilities for achieving school-wide goals are shared by highly engaged faculty, teacher leaders, administrators, and students. School newsletters describe evidence of activities associated with a strong, vibrant partnership with families and the community (CMS newsletters, 2010-2011).

Continuous learning, professional development, and innovative instructional activities are part of a culture of continuous improvement that is valued at CMS. These activities, related decisions, and associated responsibilities are shared throughout the school as evidenced by the structures such as leadership council and CLTs, as well as the support of core academic activities and remediation by elective teachers, and the CMS learning community as a whole. The principal provided an insightful overview of the school culture at CMS saying,
There has been a culture here of sharing, and not being afraid to share, which I think is probably the most powerful thing about data. If you are really going to really look at data you have to open yourself up as an educator to say this is how my students did. Because it's reflective of you as a teacher and it's hard to sit down with colleagues sometimes and kind of open yourself up to showing them how your students are doing and that you have weaknesses perhaps. But what you find out it that everybody has different strengths and different weaknesses and I think they have done a really good job of getting to that point of using the collaborative team approach to understand that if we are really going to use data honestly we need to be kind to one another and give the benefit of the doubt and to be supportive of one another.

**Trust and Respect**

Trust and mutual respect are critical if teachers are expected to share test scores and instructional practices. Trust is especially important when student test data, identified by teacher name, is openly shared at school faculty meetings and between teaching teams. Initially, this practice was a shock to the faculty at CMS. Nathan shared feedback he received after communicating how he planned to use data to improve instructional practice,

> So a lot of people are nervous … if you just put everybody’s data out there to be seen that that’s going to erode trust … are we really ready for that kind of thinking and a lot of proceed cautiously, because they’re afraid.

Alex, the former IRT, acted as a communication liaison between the teaching staff and Nathan. As a teacher, she related to teacher’s concerns, she articulated those concerns to Nathan and offered alternatives and suggestions. Alex further elaborated,
That was a real process to get them [teachers] to look at data, because they did have a knee-jerk reaction originally. They didn’t want to look at it, because it’s very revealing. It’s personal. You know, it’s kind of their guts on the table. And so, you have to go back, and I know there was discussions and talk.

Alex acknowledged that it can be difficult to overcome barriers and establish the trust required to effectively use data in a school setting. She explained that fear of accountability can affect the actions of administrators and therefore teachers,

My own theory is that it’s that fear because again, that’s on your table. You are responsible for everything that happens in that building, good, bad or whatever. It’s yours. So it’s really dependent upon those leaders and how that filters down … well, it’s a human business. It will never be anything but a human business.

CLT members in both focus groups felt they were trusted by administrators and that trust was based on their established success. Preston identified how data use relates to administrative trust when he articulated,

I don’t think that our administrators look too closely at the data during the course of the year, more of the summative [state test score]. They expect that we’re doing this [with] all these fun things. But, of course, we’re hitting the things that need to be hit and that we’re looking at our data as we go to a degree. I mean it’s a trust issue too because … we’ve had a great amount of success over the last five years, six years, seven years really since the [state test] has been a breakout test.

Lark shared her perspective of administrative trust and support,

They trust people who’ve been here and have proven themselves. I think they pretty much leave it to the teams, as long as they’re performing…. I think in the beginning of
the year, he [the principal] kind of said, “You’ve got a good thing going here. Keep doing it. I’m here to support you.”

Trust within and between teams is required for successful data use and collaboration at CMS. Establishing this trust took time, communication, and acknowledgement of individual differences at this school. Alex explained,

I think the really important piece before you put any data on the ground was that you explain the framework of what you’re going to work with the data. So at the school level when I was at the school, before that data went to anybody, there’s a lot of time spent. Alex facilitated trust building activities with teachers and explained,

We got to build trust with each other, we’re here to support each other and there was that constant revisiting of what’s our mind-set, what’s our mind-set, what’s our mind-set [and] the rest of it is sort of kind of easy.

Human nature plays a big part in how you develop that culture and that’s a change in a lot of ways and all those ideas about change theory that really feeds into, do I have good change, strategies and skills? If you don’t, you’re going to have a whole lot more time, a more difficult time with all of that.

Alex played a major role in communicating and facilitating etiquette for data-centric conversations within teaching teams. Alex explained the importance of respect,

I think that’s also critical when the people working on something [sic] kind of are okay with, let’s have a conversation about the hard stuff. I disagree with you and this is why. But [we] still have a mutual respect for each other. And that’s also, key and [something] that you can’t really measure.
It is important that teachers understand the purpose behind these conversations and trust that their teammates have a similar viewpoint. Alex shared,

Let’s look at the setup here, because you can use data for good or for evil and people can misinterpret that as saying, “It’s just a comparison,” um, “I’m better than you.” That’s not what this is about. So if you take the framework of that collaborative work, that which is the county’s direction, and it says, look, how do we get better? We get better through the work of teams. How do we do that?

Both CLTs expressed views that were consistent with Alex. Carla explained the importance of remembering the purpose behind comparing teaching results,

…remembering that the objective is to solve problems and to improve. And if you kind of keep that as, you know, we’re not here just to see what we do bad, you know, but it’s to see how can we improve this? What can we do differently? Or what areas do we need to improve upon? And you know, if you go in with that focus, then it sort of, it changes the way you look at the data, and it, you know, it doesn’t just become an exercise...

Alex summarized her thoughts about positive group interactions when using data,

Well, we have to be [thought of] as an international clearing house, as a club that says you have to be humble enough to recognize that somebody does it better than you and wise enough to learn from them. So you have to set up that mind set before you look at data.

**Shared Mission and Goals**

Study participants expressed commitment to the success of all students, trust and respect for each other, an obligation to build internal and external capacity, and pride in the accomplishments and reputation of their school. Study participants also demonstrated
awareness of how their school compares to others inside and outside the district. There is
a strong belief at CMS that student success is the responsibility of all faculty and staff.
Scott stated,

One of the nice things that you can really say about CMS is that we really do believe that
all of the students are ours, that everybody has investment in the students. At first I'm not
sure I really believed that, coming in as a new person, that this was really the case. But I
think that the former principal really did such a good job of putting some pressure on
them and say look, here's the data. He shared data not just in small setting but school-
wide and said here's this teacher's score.

CMS builds internal capacity through professional development and by sharing
information and instructional techniques within and between teams. CLT members valued
teachers’ individual expertise and styles, but showed a strong commitment to uniform delivery of
high quality instruction. Instructional uniformity is important because CLTs construct and use
common assessments, which they administer on the same schedule. The construction and
administration of common assessments is dependent on planning and delivering lessons together
so that assessments align to their instruction. Lark explained how closely the science teachers
pace their lessons,

I think Nathan and Scott also made this comment at the end of the year that he [Nathan]
was observing, like, down the science hallway and he could start at one end of the
hallway. He’d hear the introduction to lesson in one classroom. He’d go to observe the
next classroom and see the active part of it. He’d go to the last classroom and see the
wrap-up and the reflection on it. Like, it was like a seamless.
Benchmarking is a common practice internally and externally by CMS. Internal benchmarking is used to compare student scores within and between teams. External benchmarking is used to compare CMS against other middle schools in the district and the state. Scott explains why he values external benchmarking,

They were talking about this yesterday, benchmarking your school against another school. They have done that well here too. I think that makes a competitive atmosphere, it motivates people; it motivates teachers to say "hey, we want [CMS] to be the best school in the county; we want it to be the best middle school". So how is [that other school] doing? We need to know, are they beating us, if they are, what are they doing over there and to have that conversation with that school if we need to visit that school to see what they are doing, having that flexibility to do that. I think that's an important thing that we look at for data.

Interestingly, administrators and teachers appeared to value competition against other schools, but felt that internal competition was negative and nonproductive in achieving their common goals. Collaboration is an important part of the core mission at CMS. Nathan, former principal, established specific goals to increase student scores, but insisted that teachers must share successful strategies so that scores would not only increase but that there would be less discrepancy between scores associated by teacher. Lark explained,

That’s the part that I think is really ingrained in this school, at least in this team, I can speak for, that nobody is. If you’re on a team, and you’re going to be sharing data, and making tests together, and looking at that data, the idea is, it’s like “all for one, and one for all,” like, you know…. I think Nathan told me, the way he said it, “Well, if Carla, she’s been here for a long time. If … her scores are way up here, and her teammates are
down here, I’m not happy with Carla. I’m upset with Carla, because whatever she’s doing, she needs to be telling everybody else, and sharing that, and bringing it up.” So it’s not a competitive, it cannot be competitive.

And, in fact, if you’re doing better than someone else, then you’re not doing your job, because it should be a real collaborative team, where you’re helping lift everybody’s achievement up, and scores. And so, you know, don’t be proud of yourself for being the highest scorer. You’ve done something wrong by not sharing that.

Administrators and teachers expressed pride in their school and their shared accomplishments. Burke, AP, stated,

I think everybody’s data conscience, everybody’s thinking about you know, we know where we are now, and we know where we need to get to. And we, we don’t want to be categorized as a good school. We want to be categorized as a great school. So and I think everybody has that focus of trying to enhance the data, enhance student learning, so that kids can ultimately be successful here in middle school but, and in beyond. It’s something that, it’s within our culture, we talk about it.

Values

CMS appeared to value data as evidence for instructional decision making, to identify students for intervention, and as an assurance that curriculum and programs of study content were covered by the end of the course. Teachers spoke frequently about using assessment data to improve their teaching methods and to provide feedback to students. Administrators placed more emphasis on student test scores and overall student performance. All participants, focus groups, and administrators emphasized the importance of meeting the needs of each child. Scott explained that the focus at CMS is on students as individuals,
You have a big group of people talking about every single kid in this building, so every single kid is in that database [SSP tool], every single kid we walk through. I will tell you that kids that are getting 4.0 we don't spend much time on, they don't need us to spend much time on them, it's really the kids that are struggling for whatever reason. But sometimes our GT kids are struggling too, it may be an emotional thing or they are not meeting their potential so those discussions are held too. So it's pretty powerful and that sort of the history/evolution of how we got to be known as using data so well here.

Many participants expressed awareness that data are not just important at CMS, but are a national focus of educational improvement and valued by their community. Christina, DSS, shared her perspective that data use at CMS is reflective of a much bigger movement in education,

I don’t know whether it’s this school but it’s also the whole movement. Nationwide, statewide, yeah you know.... I mean it’s not a shot in the dark. It’s not like well this kid is coming to you and you have this preconceived notion. When you use your data, you know, for instance we’re trying to identify this, maybe economically disadvantaged kids … but maybe they’re passed over for the higher courses and so on. By looking at some of the standardized things first, you know, then trying to pinpoint those kids you know, and identify them as taking more challenging courses and that type of thing.

CMS demonstrates commitment to their mission and goals. Administrators and teachers use data as a tool to achieve these goals. Burke shared his observations about how data-centric practices and monitoring student progress help CMS achieve their high standards with the students and the community,
I noticed over the period of time, kids, they know that we are always constantly after them in trying to get them to improve. Overall, their work ethic has improved to a certain degree, in getting their work done. They know that we’re watching them. They’re paying more attention to what they’re supposed to be doing in class and, and we, we constantly remind them you know, why they come to school.

The CMS community contributes to expectations of school excellence. Burke stated, “I believe that it not only filters it down from the top from administration to the students but I think it also filtered out in our community. Our community expects, expect high standards.”

Instruction is the core mission of any school and CMS values achievement by all students. High expectations are placed on all students. Burke summarized,

We’re expecting the best of our students. Always, we’re expecting them to do their best. Even when the students don’t want to do their best, we always want them to constantly try to do their best. And, and our teachers, they have their philosophy in their classrooms. You can see it when you walk in and you see posters you know, we expect you to do your best at all times.

**Instructional Practices**

CMS administrators and teacher leaders support collaborative planning activities and conversations by scheduling regular CLT meetings during the school day, protecting the time for CLTs to meet, and participating in these meetings. Administrators also support and participate in grade level interdisciplinary team meetings that remain part of the middle school model. At CMS, grade level interdisciplinary core teams meet regularly but focus on individual student progress, parent communication and interdisciplinary learning activities. These team members
teach the core subjects of English, social studies, math and science, they also make remediation recommendations for individual students.

Kylie, social studies, explained how CLT meetings differ from core team meetings,

I mean each of us is responsible for taking a look at what our students are able to produce. Whenever we take a look at our kids individually, we’re looking at their test scores, their data. We’ll come together as a [CLT] group sometimes depending on if we’ve given the test at the same time. We kind of take a look at problem areas that all the kids had together. But I mean our roles individually are looking at our students in particular and seeing where their problems are as far as what we’ve taught. And then we’ll come together and say, “Hey, a lot of my students didn’t get this. How did you teach it?”

Damon stated,

Well adding to what [Kylie] is saying there too, I don’t think that we necessarily like talk about individual kids like we do in a team meeting. We are in middle school. So you know what that means with a team meeting where you talk about kids and how’s this person doing in your class because although we switch kids a lot, we’re not teaching each other students directly. So we’re more about how does this test go, what were some of the issues with it, and what can we do. But that enters then into [Samantha’s] world because the kids that we do identify as struggling we give to the closer [retired teacher that provides subject specialized remediation] to make sure that they get fixed.

**Collaboration**

Participants felt that frequent discussion and sharing information openly with each other benefited their teaching practices and student achievement. CLTs felt that unity and
noncompetition between teams and colleagues facilitated communication that improved shared practice. Shared instructional practices require strong trust relationships to facilitate collaboration, use and design of common assessments, innovative instructional activities, and successful remediation of students.

Preston shared,

> When [Samantha] and I were first teaching together, we didn’t have PLC time. We would meet after school, before school, exchange notes in the hall, and so forth. And it was about six or seven years ago that PLC started. And so that has opened up an opportunity to formally be able to meet and talk whereas before it was much more isolated. And if you have a good relationship with somebody like we had with [Samantha], then we would exchange things. But now it’s like this is our time that we meet. Here’s the opportunity to share. Here’s what are main goals are. And this gives us a chance to revisit during the course of the year a lot of the stuff that we need to do.

> Without that, we wouldn’t be where we are today without that planned meeting time.

Linda and Lark, science CLT, both stated that administrators make sure that their CLT has common planning time. Linda stated, “They make sure we have seventh period, or every single department [and] grade level department has a common planning period….The big priorities in the schedule, they give that to us. So that shows support from the leadership.”

Rita, social studies CLT, explained,

> Every PLC meeting, we meet at least once a week. Officially we meet once a week. And then we’re basically in some way, shape, or form getting together every day unofficially. It just kind of happens that we all see each other. And whenever we see each other, you
get these conversations related to curriculum and kind of, “This is what I’m doing. Hey, how did you teach this?”

Kylie explained how her core team role differs from her role in the CLT,

And I would say at least for my team when we’re looking at student progress from the individual basis, every time we meet we’ll bring up specific kids and say, “Hey, how’s he or she doing in your class? What have you found?” So we look at the individual students more just within our team. And then here we’re looking more at the curriculum in the PLC.

Damon added,

But again it’s more curriculum, as opposed to student progress per se or individual student progress…. But we’re doing it a lot of—it’s like any teachers do—a lot of anecdotal like, “My kids didn’t get this.” Sometimes it’s kind of a venting thing. But it’s not normally like, “Let’s talk about this kid,” because the rest of us don’t necessarily have that kid—unlike the team approach. So again it’s more looking at craft and process.

Preston, Social Studies CLT, explained that communication is ongoing and frequent,

I mean everyday basically walking by just, “What are you doing today?” And we generally keep pretty close to the same pace as far as where we’re at in the curriculum, testing within at least the same week of all the units so.

Carla stated,

Yeah! Just allowing the time in schedule is a big support, and I know some schools don’t always do that…. collaborative meeting is—are impossible. You know, doing this much collaborative meeting is impossible if you don’t have the time already worked into the schedule to meet.
Lark elaborated,

We couldn’t do it without it…. And within the team, I think it’s supported, because we all make it a priority. It’s not like, oh, we’ll meet if we need to, or we met if we really have to…It’s twice a week, at least, and sometimes more…We meet, and Carla has an agenda, and we’re pretty good about sticking to the time. You even put time limits on things this year.

Carla agreed that, this year, she has placed additional emphasis on using the agenda to maximize their meeting time. Lark explained,

It’s supportive, because it keeps us [focused]. We know that there is going to be an agenda, and we are going to accomplish those things, and if we don’t …we’ll put it on the next agenda and we’ll still get it done. You don’t just ever let things go away.

Kelvin agreed and added, “The other thing is we also, even if we’re going to be out on a meeting day, we also let each other know that we’re going to be there for whatever reason.” Lark added that occasionally they switch the meeting to another day. Kelvin further added, “Right, and if we can’t, we write, and if we [can], we switch to another day. And then we just realize whatever decision is made, or decisions were made that we’re okay [with the decisions].” Beth agreed “If you’re not there, you don’t get an opinion.”

The science CLT described how their investment in collaborative planning saves them time. Lark and Linda agreed that they save time on lesson planning and creating assessments by working together. Lark gave an example, “With just planning lessons. If we didn’t do that, we would be going home and figuring out independently, and that’s going to be extra time.” Carla added,
And the same with writing tests… We all write the same tests. Every single test we write is the same. So instead of four people doing… four different tests…. Yeah! It’s all just done at once, and it’s all done, you know, and that translates into we Xerox for each other, because it’s all the same stuff, you know.

Lark stated,

[Carla], as the leader, keeps the pacing guide, and revising that as we get into new days, whatever, or as it takes longer to do something than we thought. And so she’s basically done our plans for us in that skeleton, you know, we know what we have to get to, when.

So it’s just a question about figuring all that out. It’s just set.

Linda explained that uniform lesson plans save time but don’t quash creativity, “It gives you more time to be creative in actually teaching it, I guess.” Beth added, “Or spend a little time with our family once in a while.”

The science CLT collaborative processes have matured over time and the new principal has had an influence on how CLT leaders conduct meetings. Linda explained,

When I was new about two years ago, and then [Lark] was new, the meetings were more of, this is what we’re doing, and to make sure you knew [state standards], and what was expected to be taught in that lesson. You don’t go too far offtrack and do your own groovy thing. And I think that was the focus of … the last two years, and now it’s come more around to improving and growing as a group.

Kelvin responded that this change has happened over the past three years, “Actually, it was the past three years, because in the year before that…I had taught math, year before, and then I moved to science.”
Carla explained how collaboration took place before structured time was scheduled for CLT meetings,

I think also… looking at the big picture, going back in the day, [laughs] the history—This school—our department, science, and especially seventh grade science, has been doing PLC like this even before PLC’s were invented, because the school…was very overcrowded. Teachers were sharing rooms and sharing materials, and that prompted the need to collaborate very closely. So we were sharing lessons and being very strict about the time line and the pacing of the lessons even before we had a common planning time. We would meet after school and just make the common planning time.

So we have always been talking about lessons, and sharing, and being very common in what we do. We’ve never really had, you know, the teacher—the lone wolf teacher going off and doing their own thing and no one knows what they’re doing. But over the past several years, there has been an added emphasis in looking at data and analyzing data and that has been a trend over the past—ever since [Nathan] came.

Carla went on to explain that the principal added the data focus several years ago,

“Five or six years… [data] has been an added focus. The problem again comes back to we don’t always have time to do that as much as administration would like us to … but they’re always encouraging that.”

Kylie provided an example of how their CLT uses technology, the district provided learning management platform, to share teaching strategies,

This is what we’ve come up with to share our resources with each other. This is a site that in the beginning of the year we try to get all of the seventh grade students to enroll in this. And the original vision was to have everybody on one site. And then each of us
have our own individual Blackboard sites. In here we’ve got study tools and everything for the students. But then what we’ve kind of been using it a little bit more as to share resources is we’ve got this kind of dumping ground for resources done by unit. So something that we find that works really well in our classroom, we’ll upload here so that everybody has access to it. The kids can’t see that.

Kylie contrasted her CLT experience at CMS with other schools,

But it depends on where you are and how it’s embraced because I was at a school that a PLC and we never met ever. And I was thinking, “Aren’t we supposed to meet?” And then I came here and it was just such a part of the culture to have that common planning time and enthusiasm for doing things different or share ideas.

Kylie explained that the collaborative culture at CMS was the reason she came to teach at CMS,

I actually student taught here for English because I’m licensed for both English and history. And my plan when I got out of college was to get away from [this area] because I grew up here. And then after being at this school, I came here during their World War I unit. And I was here for part of the 1920s unit [Rita] was doing the sightseeing trench warfare with [Preston]. I’d seen [another teacher] doing radio shows with her students. And I went to speak to [Nathan] at that time because I knew that [Samantha] was retiring. And it was basically, “Okay, if I get the job offer at [CMS], I can’t pass that up because it’s such a good PLC.” And so it’s literally because of this PLC that I even live in [this area] right now.

Samantha, retired resource teacher, agreed that groups at CMS work well together and focus on improvement,
And that’s I think something that’s really unique to our group peers. We’re always looking at how we can get better and discussing what didn’t work…I mean we’re positive. But we’re able to see where we can be better.

Preston explained how teams work to get better, “So it's beyond the teachers sharing strategies, because it could also mean that my kids that are struggling with fractions could spend some time with you.” Teachers share instructional strategies but they also share specialized teaching skills directly with students from other classes. A *switcheroo*, at CMS, is the practice of exchanging students with other teachers for particular lessons or skills practice.

**Common Assessments**

Assessment of students is a core instructional practice at CMS. Teachers use the district tool to administer formative assessments on-line or paper and pencil. All middle schools are required to administer scheduled district-wide benchmark assessments which are used for reporting and to measure progress and areas which need to be addressed within the curriculum standards.

CMS has gone beyond the district requirements and uses the district formative assessment system (DFAS) to construct and administer frequent common assessments. CLTs work together to construct common assessments, they administer them on a similar schedule, and then collaboratively review the results. This information feeds back into their instructional planning and identifies areas which require re-teaching, reinforcing activities, or for which the assessment was inaccurate or confusing to students.

The use of assessment is often a topic of discussion at CMS. Lauren, AP, explained that data and assessment conversations take place frequently at CMS,
And then there was this philosophical discussion as do you use that DFAS test grade as a test grade for those ESOL kids, which we know they’re struggling with, or can you use it for something else, you know as just a class work grade. But it’s a common conversation to talk about [DFAS] tests or how students are doing or the data that… I would bet that many of our teachers could tell you which kids in their class didn’t pass a [state test] the previous year. They can name them.

Carmel, ESOL teacher, corroborated when she shared her concern about assessing ESOL students,

With ESL there’s always a challenge because generally we use multiple choice assessments to determine whether or not they’ve gotten the information. And for them a lot of times they could know the information if they were assessed differently, but just the structure of those tests sometimes trips them up because sometimes they don’t really understand the question or there’s a lot of vocabulary in it that they’re not familiar with. So, it’s an assessment that probably makes sense for a majority of the students.

But for ESL population, we do the [DFAS] assessment for the lowest level kids. We feel bad about doing the [DFAS] assessment because it really doesn’t match their abilities, especially for the lower [language proficiency] students in terms of their ability to show what they know. But everything is going towards that. So what we’ll do is sometimes, I’ll take that test and I’ll put it in plain English or give them some additional vocabulary support. We have the kids using dictionaries with it now which I don’t know if they were before.

So that’s just always a challenge because, especially for [sic] levels one and two in the low three’s, sometimes they just don’t get the question when it’s asked in a
multiple choice format. Or it takes them a really long time to get through those tests because they’re really having to figure out what each answer means whereas a child whose English is the first language a lot of times they look at it, they read it real fast, they can see immediately which ones don’t make sense. So it doesn’t always show everything that they know.

The Social Studies CLT members provided several examples of how their examination of assessment results provides information that they use to improve lessons and often to improve the assessment instruments.

Preston explained,

One of the things this reminded me to go back to—I don’t have the copy here—but we have a paper copy of basically the essential knowledge that students have to know according to the [state tests]. And often times that’ll require me to go back to look at that to make sure prior to giving an assessment that it matches up. Because I think it’s very safe to say, that we go well above and beyond the [state tests] and POS [Program of Studies].

Many forms of assessment, standardized tests, embedded assessment such as classroom feedback, end of unit tests, and hands-on learning activities also provide feedback to instruction. CLT participants also referenced their use of assessment results as feedback to students. Rita shared how she balances feedback from multiple choice items with other forms of assessment,

And I would say that part of the challenge too that is you want the data and the easiest way to get the data is multiple choice and so it kind of takes away from some of the higher level thinking. So it just kind of, you have to make sure that as you’re going through the unit: you do your quizzes, you do your questioning, your warm-ups: that
you’re getting that analysis in there so that by the time they get to the more basic multiple 
choice, you know that they have at least gone through the thinking process.

Damon shared,

Yeah, did they all put the same answer? If they did, why that answer? And we try to talk 
to them the next day and they’re kind of like, “I don’t always remember why I put that or 
what I was thinking.” So it’s nice to have the data that, yes, they missed that question. 
Why they got confused or things like that or trying to go back and re-teach it in a way 
that they’ll understand it, that’s a little bit of a harder step to take sometimes.

Rita expressed an alternative perspective related to common assessments,

And for me as a parent, I mean just this emphasis of data in [DFAS]. I mean my 
daughter comes home from school talking about how she did on her [DFAS] test versus 
learning. I mean I’m just going to speak plainly. I mean even [Damon] saying, “What’d 
you do wrong on this question?” We’re teaching them how to take a test. And it’s very 
discouraging as a teacher like it’s almost like you’re taking more out of like opportunities 
to learn something different by spending time looking at your data.

And I still think it’s more powerful for kids to have a test in front of them and 
highlight key vocabulary that they misread versus projecting what everybody did. But I 
mean that’s the one negative. There’s positives also. But it’s just interesting to see the 
change over time how kids are just so focused on, did they beat the test versus learn the 
material.

**Analysis and Interpretation**

At CMS, data often inspires discussions about practice and opportunities. The use 
of data is not the responsibility of a single group or person at the school. Participants did
not view using data as an add-on to their typical work but instead as an integral part of their work.

Scott explained the importance of interpreting data to meet the needs of students at CMS.

I think having strong collaborative teams that are open to looking at their results and then getting to the point where if a student is not doing well in my class but you’re good at talking about fractions then how do I get them to you so that you can help them. Owning all the students, we all own them, it's not because you teach them and I don't, they are all Central Middle School students.

Christina, DSS, explained that it is part of the culture at CMS to use data to design and evaluate the success of programs at CMS. Past attendance data from parent meetings are used to select dates which are likely to yield the highest parent turnout. Similarly, after careful analysis, CMS decided to provide all information electronically to teachers and most parents for their school opening. Christina extended her example,

Data promotes student… learning… because you make curricular decisions based on that. You also are able to look very clearly as I was giving you examples of different ways. You know, when you work at a PLC and everybody sees it and [suggests] a method or a particular strategy, you look at the success of that on [DFAS] and you will know that was a successful strategy or that wasn’t….

Kylie shared that the CLT uses data to identify and monitor areas of concern,

I think another part of this is looking at the subgroups. We always go over where our subgroups were at the end of the year at the beginning of the new school year. And that’s our biggest concern here at [CMS] is that we’re not hitting all the subgroups.
Preston explained how formative and summative data are also used to help students understand their strengths and weaknesses,

Yeah and kind of an objective item prior to [DFAS], … we gave tests on Blackboard [learning management system] and so we could get objective data from that. I think for me the most valuable thing in it isn’t conversations that we have based on that, it’s projecting it on the screen for the kids who just took the test. And for me, we talk over anything that’s lower than 75 %, so kind of C minus/C: “What happened here, what happened here?” And, of course, sometimes some of the students will say, “Oh, I thought it was this” and “Oh, that.”

So it’s not just reviewing, but it’s also the kids when they see like, “Oh, 80 % got that or 100 % got that.” Then that kind of helps them to make a connection of how well—I mean it helps us obviously know how well it was received. But also it kind of helps them. You know just thinking by going over a test and just saying, “Okay, did everybody get A for the answer,’ you’re not looking at everybody’s interest level. They’re like glued to the screen when you’re projecting results up there whether it’s through [DFAS] or Blackboard.

Teachers within the same CLT agree on the value of this practice, but have established different criteria to determine which test items they review with their students. Kylie explains,

Because they’re so happy if they’re part of the group especially—I do it the same way as [Preston]. For me, it’s any below 80 %. If less than 80 % of my class did not get the answer right, we review it. And they are totally proud of themselves if they’re part of that group that did get it right. And so there’s just kind of that level of it. And then the other kids who did not get it right, they’ll see that they’re not the only ones. So there’s
just kind of that reinforcement for the students as well of, “Okay, I understand where my mistake was now.”

Kylie describes time as a challenge related to analyzing and interpreting data,

Today one of the big challenges also is just time because going back reviewing everything and going through it with the kids does take quite a bit of time. And when you face moments like last year when we had the blizzards, we were out of school for the entire week or so. This year we had our several snow days in a row as well. You kind of come back to school and you have this notion of, “Okay, I have to play catch-up now.” And when you have those moments where you kind of feel like maybe you’re falling behind, it’s a little bit harder to get yourself to go through that whole process because you know it’s going to take the time. And so I would say that that’s one of the challenges that you kind of have to get yourself into and say, “Okay! Look, yes, it takes time but it’s worth it.”

Teachers and administrators provided examples of their data literacy and inquiry focused use of data. Alex, IRT, shared,

I run the risk of making the wrong assumption or the wrong intervention, which is worse in a lot of cases because it’s not that the kid didn’t like math. Maybe something happened in that kid’s life. Maybe we need to be a little more caring about how we handle that kid. It’s just interesting the questions that come out of the data. There are usually more questions if you do it well, I think you leave with way more questions then you had coming in. Well I think with data you do.

Kylie shared,
They give us all the data at the beginning of the year. They give us the [state test] scores from the previous years. They give us the numbers that we need so that we can look at our students based on what they achieved from previous years. But like [Preston] said, it’s just kind of “Here’s the data. Do whatever you’re doing with it because it works.”

Preston stated,

With that being said though, the sixth grade [state test] is a lot harder and sometimes it’s washed aside because elementary school sometimes focus on math and English a little bit more. So sometimes we get a kid that they didn’t pass the history [state test] and then they’re getting an A in your class. And it’s more likely something that happened on the elementary side as opposed to a kid issue. And it’s good to watch them.

Preston explained,

I wouldn’t immediately throw them into [state test remediation] because sometimes the administrator is saying, “Why isn’t that kid in there?” Well that kid’s got an A. He must just not have good instruction or enough time or maybe they were absent a lot. I don’t know. But it allows you to think more clearly and give a 360-degree evaluation of the kid. And then you’re talking about it in your teams too what have you seen from Daniel J. …what have you seen from this particular student.

CLTs appear confident in their ability analyze and interpret data to identify areas of weakness and to identify students for remediation but are not complacent about student outcomes. Rita shared “We’re a little bit worried about this year. Our population is a little bit more difficult than we’ve had in the past.”
Innovation

Creative teaching practices are valued and supported at CMS. Although well-known for their use of data and assessment practices, CMS continues to innovate in the classroom. The Social Studies CLT described history units which re-enacted specific events in which students, teachers, and administrators participated in role-based re-enactments. Additionally, it is common practice at CMS to participate in switcheroos, teachers that are particularly knowledgeable or have had excellent results demonstrated by student results, administer the content lessons. Students receive instruction from teachers other than their regular classroom teachers. Sometimes, teachers outside of their assigned subject areas teach these lessons. CMS administrators value and support these activities. Kylie described the support and involvement by their administrators,

They’re [the administrators] very involved in pretty much everything we do. Our administrator for U.S. History is Lauren. She’s the assistant principal here. I mean she supports us in pretty much everything we do. She secures places for us when we do Ellis Island. She secures the cafeteria for us for the day to make sure that’s all reserved. Our principal is currently the fuzz. He’s the one that’s coming in and busting up our speakeasy and arresting the kids and taking the bribes to leave because Al Capone bribes him. So he’s no longer arresting anybody or anything. So they’re very involved in everything that we do.

Preston shared,

And it’s a time thing because there are other schools maybe that are struggling more over their data. I think there’s this view that [CMS] is data obsessed because [Nathan] was our principal there was the king of data, Data [Nathan]. I think there was that and there
still is that to a degree. But speaking within this group, I think that we’ve always been aimed at experiential learning. A lot of the things that we do and the time that we put into it is into creative exercises. For instance, have you seen the movie Bill and Ted’s Excellent Adventure?

Damon shared some examples of experiential instruction,

Well we re-created Bill and Ted’s Excellent Adventure using different characters of the time. We do switcharoos [teachers exchange students]. We have a World War II day where we bring in a hundred World War II veterans. That’s a good example of our work product.

Samantha explained the importance of innovative instruction,

But the fun stuff really triggers the kids because I’m reviewing what they had at the beginning of the year. I start at the beginning of the curriculum and get as far as I can go before the [state tests]. And we were doing a word wall the other day with westward expansion and I just immediately had to say, “Well, you remember Annie on the prairie and you remember the cowboys out in the locker commons.” “Oh yes!” And so then the words started to come out…

**Interventions and Remediation**

CMS has developed a portfolio of interventions and remediation techniques to facilitate student achievement. Activities occur during and after school hours and involve a variety of resources. Students have opportunities for special interest activities during a scheduled activity period during the school day. Students who have not completed homework or assignments are required to attend special sessions until their work is completed.
Administrators run a boot camp program at CMS for students who need additional support, monitoring, and frequent follow up for incomplete work. Students attend boot camp after school. Lauren, AP7, explained how she provides follow-up to her boot camp students,

I actually called someone on a [teacher] workday and said, “I see from the progress report that you didn’t turn in…you’ve got this project that’s due today. You need to e-mail your teacher that work.” This was a teacher workday. They were at home. You know you need to e-mail your teacher this by the end of the day, by the 3:00 today, or you'll be in my office.

Students also have opportunities to attend a voluntary homework club after school. Christina explained,

…Another thing that’s been really in my 25 years, that’s been so much vastly different, and that is time on task and looking at your school days. And you know, taking advantage our after-school activities. The learning goes on….So that’s the way, the reason that’s [homework club] designed that way….Home is not the most productive so we have these homework clubs and one is social and one is absolutely quiet so they can work on their group work or quiet.

And what we found was based on the data; we found that the percentage of homework turned in on the daily basis went way up. Way up….so that’s been a completely different evolution with….socioeconomically at your family’s and single-parent families or …since I started in education…

CMS offers a proactive intervention program in the summer for sixth grade students who will be attending CMS in the fall. The DSS and counselors use data from their feeder elementary
schools to identify students who may benefit from early orientation and skill building before they arrive at CMS. Christina explained how counselors began Fresh Start,

….A good example is my counselors using the ASCA Model; they are applying for RAMP so they are actually designing. They started right off with a group that we had the data. We did not even know the students yet, but we put together …a Fresh Start group. Where they [students] worked on study skills, where they worked on test taking, where they just worked on transition from sixth grade to seventh grade and then they were mentored and started off…for a new setting and that came all out of just reviewing two months of records and spreadsheets…. I invited all them even before their school ended last year based on all this. Then my counselors started day one with them in a group.

Christina shared that the Fresh Start program has increased the success of transitioning students at risk of failure to CMS. She also travels to elementary schools to administer Scholastic Reading Inventory (SRI) tests in the spring, when required, to provide the screening data used to identify students for Fresh Start.

CMS promotes active student participation in after-school activities to develop positive student attitudes that support their academic mission. These clubs provide enrichment experiences and mentoring opportunities, clubs include sports, cooking, drama, science, math, environmental service, peer tutoring, and vocabulary challenge (CMS: After School Programs, 2011). Sponsors collect student attendance and feedback data from after-school programs and clubs. CMS monitors and reviews this data as part of their school improvement model. Scott explained,

One of the things that the [district] wants us to do is Service Learning. Our after-school program has done fairly well with that and we have an attendance tool for our afterschool
program so we know every student that attended and where they are. That helps track how many kids are actually doing some of the service learning components, so that's been something that has helped us. That data from that attendance tool, where those kids are, which groups they are attracted to, what those groups are doing as far as service and how we can improve those. An example would be our [Environmental] Club, they are a recycling club, but they don't just recycle in the building, they recycle outside of the building, stream cleanups on Saturday. Many of the hours they get from that are used for National Junior Honor Society or if they are on student council and the civics component in the eighth grade where you have to get certain hours. So that data helps drive, ok the [club] work pretty well but we are only getting about 20 kids that consistently show up. What do we need to do to change [this club] to attract more kids? So that's sort of looking at school improvement.

Throughout the interviews, participants emphasized the need to see and understand the whole child. Kylie explained that raising test scores is not the only focus at CMS, Like even remediating kids we have a mentoring program here to offer those kids and it’s usually the kids that didn’t do well on the state tests because maybe they have emotional issues at home, home issues, I don’t know. But it’s not just about their scores. It’s about the whole person.

CMS has a special intervention for disorganized students. Nathan described how this worked through the after-school program,

…well we used to do an extreme home organization. And a parent could call into this group of teachers and say, “Hey, Bill needs extreme organization makeover.” And then they would descend on them, right, and take him to his locker, help him clean everything
out, give him some skill sets, and make sure the parents had access to the Blackboard. So this thing took like a couple of days to do it, put the kid back in the game. Sometimes that did it. Maybe a month later, parents call back and say, “Billy needs extreme organizational makeover again.”

Retired teachers are an important remediation resource at CMS. After teaching teams identify students who require additional instruction in core subject content, Scott hires retired teachers to teach small groups. These retired teachers are selected based on their knowledge of content and past success teaching students. Preston described how the CLT uses data to identify students for remediation programs,

And we use some of that data to identify. We have an [state test] stoplight that used the fifth grade history [state test] and sixth grade history [state test] reading score because every test is a reading test and then their individual scores on the early test of the year. And then at the end, is easier to show you, but there’s a green light. This is on the Excel spreadsheet. It’s green if the kids are fine, yellow if we’re going to watch, and red if they need to go to [Samantha]. And so we have kids that are in the red area that then go to her. So we do get that data pretty early in the year. We’re able to make decisions about what kids need remediation.

Samantha explains,

Well, I meet with kids during activity period once or twice a week. And basically the data that comes from all of you, the [state test] data with all the different strands and I identify areas of weakness and try to focus my teaching, re-teaching, on that. Test scores, it’s been slow starting this year. We haven’t really gotten into that yet. But at some point, I’ll be getting test scores as they take them, of the children that I have, and seeing
how I can go back and re-introduce material, review it with them, and get them ready for the [state tests].

There are between eight and 12 students in Samantha’s small class remediation groups. Core teams identify students for remediation in November and December. Samantha begins remediation with these students in the January. Preston states, “This is her third year of doing it, and [Samantha] has very high rate of success. That’s why we pay her such large sums of money.” Many of the students receive remediation in several subject areas, Kylie explained,

And the other thing is with bringing Samantha in, we discussed this with [Scott], our principal, last week, is that a lot of the kids that are being remediated are being remediated in other classes. And we think having a fresh face and a different approach to teaching helps them hugely rather than them having [students] come to me and listen to my voice again. [Samantha] has a really good rapport with the kids. And they view her in a really kind light because they know that she’s there to help.

Samantha also teaches one remediation group of ESOL students that focuses on vocabulary skills to prepare students for the state test.

Many participants referenced empowering students to take responsibility for their own learning. Alex shared her opinion and experience,

How do we get them to be more responsible for their own learning? If teacher are working harder than the kids and I used to say that in the classroom “If I’m work harder than you, I’m doing something wrong” and I am. If I’m working harder than them, but I don’t mean harder in a bad way, I just mean they should be more engaged. I should be facilitating more and I think with data, you can start to do that, but I don’t know if we’re there yet.
Alex explained how data can inform teachers and identify remediation strategies,

Oh boy! I’m a completely different person since I started. This journey’s been now about six or seven years and I always use data, but I would be a way better teacher if I went back in the classroom now, way better. I wouldn’t be stabbing in the dark. And sometimes you would spend three or four hours working with a kid after school and not really knowing why. We’re not really trained… [as] teachers to be able to pinpoint where a kid’s deficient. Intuitively, we kind of guess “I wonder,” but we’re not told when a kid does this. Here are some strategies to help.

**Professional Learning and Development**

Professional development and learning is ongoing and tied to a school-wide commitment to continuous improvement. Participant teams and administrators demonstrated a culture of mutual respect and trust which supports a continuous learning model. The focus group CLTs appeared highly collaborative and synchronized in their efforts to educate each other, plan and improve lessons, and support each other in their teaching. The CLT structure provided examples of internal capacity building and relationships that extended beyond school hours. CLT members who were committed to a shared mission, showed enthusiasm for their craft, and were open and honest about their perceptions and opinions.

**Continuous Learning**

Learning is a continuous process and is foundational to the CMS improvement model. When Nathan began the data-focused journey at CMS, he identified three ways that teaching teams could learn and improve: a) transfer of knowledge between team members, b) sending teams out to other schools to learn from and observe successful techniques, and c) formal or external training.
Nathan found that CMS teachers all had strengths and that common assessment results identified these strengths and provided opportunities for teams to discuss their strengths and weaknesses. Nathan’s first focus was on building the transfer of knowledge between team members. If he saw large discrepancies and gaps between team members he would try to create the conditions and expectations that they need to share what they already know. Nathan explained,

So where we get derailed in [this district] or in education period, is that a lot of times we put most of our efforts at the third way which is to provide formal training or send members to see a particular strategy and then have them come back and make their teams better….my question to you is if the team can’t transfer what they already know between members on a team for which they meet every day, what’s their chances of them going to a fabulous training and coming back and training everybody up. Not too good!

Christina, DSS, shared,

You know, I mean it’s like a continual process, you know, where you’re trying to improve, you know, an instrument or so on. We have gone from we were in [DFAS] pilot that is just been refined, refined, refined, you know, and keeping up. And with that goes a lot of the training of course but just really much more sophisticated in analyzing the results, what they mean and therefore reacting to them and changing something.

Samantha stated,

It’s interesting, though. I do need to bring up the point. [Scott] sent out an email last Friday about groups and how groups work well together and what kind of groups work well together. And it was interesting because he brought up a point that the best groups are people that can share what they didn’t do right or what didn’t work best. And that’s I
think something that’s really unique to our group peers. We’re always looking at how we can get better and discussing what didn’t work as—I mean we’re positive. But we’re able to see where we can be better.

Kylie stated,

Right, that’s really a good point to bring up because we will spend a little bit of time each meeting just saying, “My kids did not get this and how did you teach this because what I’ve tried is just not working with them.” And so there’s kind of that self-awareness to it that you need to have in order to get over the hump. And I think that all of us have that pretty good self-awareness of, “What did you do because what I’m doing isn’t working?”

**Data Centric Conversations**

Nathan identified the purpose of data at CMS,

I think your data set does three basic things for teams. It gives some concept of their relative progress as a team toward whatever their goal is and that’s an important facet. It also identifies gaps in student learning so you can intervene and close them. And it also gives you the capacity to develop your teacher core. So if you look at the data as a reflection of our own work as teachers, then you can use it to get better.

….If you’re using data to help your teams get better, the following things would have to line up. They would have to have a collaborative protocol that led them through that process in an efficient manner. They’d have to have their data collected in a way that everybody understood it so that they could view it in a common way so that they could actually get the most out of what it had to offer.

Nathan explained how he used data to challenge and empower teams,
Then what I did in my collaborative teams is I would challenge them to figure out how to do it. So what we want to accomplish and what evidence we would use to measure our progress that was something that I spent my time setting up just like I described. How you do it is up to your individual team, right, and will use the data set to see how well you figure that out. And that really worked, because it empowered teams, right.

Data protocols are practices for using and discussing data within groups. There are defined data protocols in the district supported by centrally offered professional development. Alex, IRT, explained her role in supporting the use of protocols for data centric conversations at CMS,

[The district department of instruction] has a data protocol that’s out there and it’s very good and … it’s very meticulous. That data-driven instruction is really good, but is it realistic? What are the key questions? So what we’ve done is we’ve taken down that protocol and kind of streamlined it a little bit for people in the classroom to say – because there’s no time. It will be great if we could all talk about “What do you predict” and then “What are your assumptions?”

They need to get to the meat of it, they’ve got those kids coming in tomorrow and they have to know what to do. So I think we have to be realistic about what we’re asking people to do too, because the demands are just sometimes crazy. The protocols and the process, that’s huge even if there’s a structure out there at all is brilliant, because it just lets people kind if think about the way we handle information.

Alex provided professional development at CMS that integrated data inquiry and decision making. Alex summarized her role,
I think part of my job is to be able to say to a group of teachers “Look at this. What do you see?” And then they made better decisions about how to deploy resources, because that’s really where it comes down to. How do we deploy our resources, human and monetary?

CLTs in this study appear to have internalized the data protocol referred to by Nathan and provided numerous supporting statements. Rita shared,

Yeah and there’s things that throw it off. I have a fourth period class that there are four students in there that are always absent. And then they take a test, and it definitely throws the data off. So how do you do that? Will you take them out and then look at the data? So I mean there’s always just things that happen. It’s a good conversation starter though for any PLC.

Kylie agrees,

Right! That’s really what I would say that the best way to use data is it’s a starting point. It’s something you can look at, but you have to do more. You have to go beyond the data in order for the data itself to be successful.

Protocols and teachers’ ability to participate in productive data-centric conversations developed over years and supported by principal expectations, scheduled CLT meetings, and training provided by the Alex, the school’s IRT. Alex explained why time and patience is required to facilitate these conversations,

…You have to be humble enough to recognize that somebody does it better than you and wise enough to learn from them. So you have to set up that mind set before you look at data or else people are just going to throw it away. So there’s a lot of time and for some
people they could pick up on it once. But other people need a couple of times, they need to revisit it.

…So I think we have to be realistic about what we’re asking people to do too, because the demands are just sometimes crazy. The protocols and the process, that’s huge even if there’s a structure out there at all is brilliant, because it just let’s people kind of think about the way we handle information.

Capacity

Nathan, former principal, and Scott, current principal, have built internal and external capacity at CMS over several years. Nathan’s focus on transferring knowledge within and between teams is evident from the practices shared between teams. Nathan referred to this practice as internal benchmarking,

I believe in the world that we live in that this is a collaborative environment. That if you’re actually using the resources that are present within the team that you have, regardless of what kind of team it is or what that team does, your first step to get better is to make sure that everything that’s working that people on that team know everybody on that team knows, right. So that’s kind of I guess Deming would probably refer to as an internal benchmarking.

Nathan frequently compared assessment results at CMS with a similar middle school within the district. He referred to this practice as external benchmarking, Nathan used this practice to build capacity within CMS, he explained,

…This process one of the key things… the first one that I paired with was [East Middle School]. Right, and the principal and I would benchmark off each other daily, sometimes multiple times daily. Right, and we both pushed very hard for the development of
[DFAS] and access to tool that would give us the ability to do frequent common assessments without significant brain damage, okay. Not that [DFAS] is perfect, but we built our capacity with it over time.

CMS uses the term benchmarking to describe the practice of internal and external data comparison. The term is also associated with district-required common assessments, referred to as benchmark assessments.

CMS also builds internal capacity through the training and mentorship of new teachers. Mentoring of core teachers takes place primarily within CLTs. Lark stated,

[Carla] is good about, like, not just letting a new teacher hang and figure it out. So—and you got—probably hated this, too. You hated this, too, because I was the new one last year. So every meeting would be about, “Here’s the lab we’re going to do.” We’d actually do the lab. She would get out the materials, and she’d set it up, and say, “They knew what they were doing.” They’d already done it, but they sat politely and let [Carla] tell me what to do. But they still came to every meeting, and they still threw in their stuff. So this is the first year there hasn’t been a new teacher.

Over time, with low teacher turnover, CLT members are able to focus beyond curriculum requirements and more on their teaching craft. Carla explained,

Right! So, in that way, …because the group is more experienced now, we can actually work on improving things, which we haven’t been able to do in years, because it was always new to someone….But we can improve our lessons, and that just changes…with the composition of the group, people can contribute different ideas, you know, new ways of doing technology, or a different way of presenting something. And so, the focus of
our conversations change more into sort of the implementation of the lessons, improvements, and improvements in the assessments, things like that.

CLTs learn together and work toward continually improving their teaching methods and techniques. Preston explains how their CLT used Japanese Lesson Study to improve instruction, …one thing that we dabbled with is actually popular in Japan: the lesson study. You familiar with that at all? Basically it’s a team of teachers who works together for weeks or months even to make one lesson. And then one of the teachers will do that lesson….And it’s not just the lesson, it’s the assessment. It’s all the different components.

….. The other teachers come in and observe the lesson, not to observe the teaching per se, but to observe the lesson and how well it worked and to talk to the kids about it. And then the rest of the teachers get to do it the next day. And they can tweak it and make it better…. like in our classes, like in third period for me is my guinea pig…. it gets better during the course of the day seemingly. This way you can even make it even better because you have 24 hours to respond to anything.

Preston provided a description of the outcome of one of the CLT’s experience using Japanese lesson study,

One thing that we had in the past was at the end of World War I, the League of Nations, and the United States rejecting that, and so we identified that. We spent weeks making a lesson and Mr. Roman employed it. And I think one thing that we noticed in there wasn’t enough visuals, political cartoons or something, because the kids needed that. So then the next day when the rest of us did it, we added the political cartoons and kind of closed the deal on it. And that takes a lot of time too.
Commitment

The leadership at CMS supports teachers and school improvement activities. This commitment is demonstrated by the principal, assistant principals, director of student services, IRT, CLT leaders, and core team leaders. Elective teachers demonstrate their commitment to these activities by participating in remediation activities and flexibility to support and protect CLT and core team meeting schedules. Time is a challenge that participants acknowledged throughout the interviews and focus groups. Scott summarized,

Sometimes they ask me for substitute time to plan and that's really legitimate. You know we are asking them to be in these teams and do all this work but they don't have enough time sometimes to do their planning for their own classes, so time again if you can provide them a resource of time, I think that is important.

Administrators and teachers at CMS are very familiar with the academic status of their students. This awareness extends to the counselors since they periodically update the SSP data. Counselors monitor student success and are able to update parents without contacting core team teachers. Lauren, AP, provided an example of the familiarity of student status she shares with her teaching teams,

They probably could give you the names of the kids that didn’t pass them. They know that information. So, it’s definitely ingrained and it’s used daily….I am familiar with who my struggling students are, but I probably know the other grade level even though they’re not mine. I know who those struggling students are and what we can do. I think there’s probably a piece at every facility meeting where we’ll bring up something about data and how it can best be used and, again, are we focused in on using the data appropriately and for the benefit of all. I think it’s always there.
Kylie shared that it can be difficult to stay committed to data activities when other events impact the schedule,

And when you face moments like last year when we had the blizzards, we were out of school for the entire week or so. This year we had our several snow days in a row as well. You kind of come back to school and you have this notion of, “Okay, I have to play catch-up now.” And when you have those moments where you kind of feel like maybe you’re falling behind, it’s a little bit harder to get yourself to go through that whole process because you know it’s going to take the time. And so I would say that that’s one of the challenges that you kind of have to get yourself into and say, “Okay, look, yes, it takes time but it’s worth it.”

**Perceptions**

Participants in this study demonstrated a very positive attitude toward their school, their jobs, and their colleagues. It was obvious to the researcher that the two focus group CLTs had developed good working relationships and that they used mature collaboration processes built on trust and mutual respect. Participants answered questions with passion, enthusiasm, and often a sense of humor. Both administrators and teachers provided reflective, self-aware responses with ease. The focus groups easily built upon each other’s responses to the interview questions.

Although most examples provided by participants were positive, some teachers shared opposing opinions. Rita shared her reaction to the principal showing student data identified by individual teachers in front of a school staff, “and I thought it was hideous because Preston might have been a yellow triangle and I was a green circle. And it showed where you were on this scale and it was very intimidating, I thought.” Preston confirmed, “Yeah and it was shown in front of a staff meeting.”
Nathan explained that he was very open about teacher and student performance metrics and that he did specifically identify individuals. He elaborated,

So a few years into my tenure, I wouldn’t recommend doing it necessarily as your opening message as the first year principal. It probably wouldn’t be a great idea. But within a fairly short order after that, I would do this opening sanction with my teams. And the first thing we would do would be to display the data sets like I just described to you with everybody’s name on it and everybody knew what dot was who, where their starting point was, and where they ended up, okay.

Nathan acknowledged his awareness of negative teacher perceptions when he shared,

I’ll give you a little story on that one, experience about how you communicate to your staff. So, at first, how data will be used to improve practice. So a lot of people are nervous about, well, if you just put everybody’s data out there to be seen that that’s going to erode trust and that are we really ready for that kind of thinking and a lot of proceed cautiously, because they’re afraid.

The open presentation of student data associated to individual teacher and subject has evolved over time at CMS, but remains a sensitive topic for some teachers. This may indicate that while trust is high within the focus group CLTs, there may be a lower level of trust across the school. When asked if the practice of identifying teachers still occurs under the new principal, Rita responded,

We don’t know. I think that they probably still do it. But it was just kind of humiliating to come into a school year and have that there in a faculty meeting so you could see who the weak link was in every department.
Kylie added, “I love seeing it just within the PLC.” Rita agreed, “Yeah it was okay with just in the PLC, but it was shown to the whole faculty. It was just demoralizing.”

Preston also expressed his concern regarding overemphasis on data. He elaborated on his understanding of how data use complements teaching practices at CMS and how that differs when compared to other schools,

And there’s an opportunity cost with it too, like my wife’s school in another district, they failed the AYP this year. And all they do is go through data. And they’re not sharing best practices then. They’re not creating something with all the minds that are around the table. It’s like what happened with this subgroup, what’s the question? And their principal is like in their face about it.

Christina, DSS, explained that counselor’s perceptions of their program differed from their survey of students, “Well, quickly when we got that. The counselors were very disappointed with certain questions and really looking into it. We felt very strongly that was not a reliable instrument.” Students answered the survey at the end of the school year and counselors suspected that the survey instrument was faulty. Christina further elaborated,

You know, [we] found out a couple things…. they [counselors] think they’re so visible with lunch and the teams and all. But maybe they do need to make it [their services] more available. And we found out that one of the hurdles was the front office [staff] who were trying to protect kids and keep them in class and so on, you know. So that’s a type of thing. Because in the middle school, counselors are pretty involved with students.

…they do a lot of counseling. It’s brief and intermittent but it’s often.

Christina shared her overall viewpoint and perceptions associated with data use,
You know, just using that, looking at your strengths and of course, I guess I would have to say with the [state tests] and with state reports and this becoming such a public, you know, well-known entity. I think… we all became familiar with… the report card of our district and different districts and so on. So… you kind of get used to reading it and looking at it. And you buy into it. It wasn’t a hard sale, you know.

I don’t know whether… it is this school, but it’s also the whole movement. Nationwide, statewide…. I mean it’s not a shot in the dark. It’s not like well this kid is coming to you and you have this preconceived notion. When you use your data, you know, for instance we’re trying to identify these maybe economically disadvantaged kids… but maybe they’re passed over for the higher courses and so on. By looking at some of the standardized things first, you know, then trying to pinpoint those … and identify them as taking more challenging courses and that type of thing.

**Summary of Findings**

There is no magic formula for school improvement. Data can be a powerful tool within a school that seeks to improve their practice through shared, inquiry-based learning. Nathan summarized,

I think a lot of times folks are like just give me the magic formula and I’ll go do it. And then when they do it and it doesn’t work, they say, “Well you gave me the wrong magic formula.” So we [have] got to resist that temptation. I mean not that you don’t coach people to do some stuff that you know is right. But ultimately their combination and what that looks like in their school is up to them in their team.
Chapter Five
Discussion
Overview

This study used a constant comparative method of qualitative analysis to describe the phenomenon of data-focused decision making within a single, high-achieving middle school. Interviews, focus groups, and document analysis yielded rich descriptive data about the processes, organizational structures, practices, and experiences of the principals, administrative staff members, and teacher participants. The design for this case study was based on reviews of literature and research studies related to educational data use, assessment, implementation, and professional learning communities. The purpose of this study was to describe and understand how a principal successfully implemented the use of data as an integral part of the operation and decision-making processes within a middle school to promote student learning.

The researcher identified five major and interrelated domains that emerged from these data to present an organized description of Central Middle School’s data use journey. Findings from this study will add to existing educational data use research by providing information about how school-based leaders can influence the implementation and successful use of data for instructional decision making and school improvement. Additionally, this study examined how a principal influenced the use of assessment data by teaching teams and may act as a guide for site based implementations. This information may be important to principals, directors of student services, teacher leaders, assessment coaches, and teacher researchers. Lastly, the information gathered from this study may help prioritize future enhancements of data tools and related professional development for both school-based leaders and teachers.

Chapter Five relates the findings of the study to the literature, organized by the five major domains of data use that emerged during the case study of Central Middle School, and presents a
summary discussion of research questions. The chapter ends with surprises from the study, implications for action, recommendations for further study, and conclusion.

**Findings Related to the Literature**

The findings from this case study describe Central Middle School’s journey of data implementation to become a mature learning community with a culture of shared leadership, decision-making processes, responsibilities, and success. No single factor or person is responsible for the school’s success in promoting student learning through the use of data. Instead, the evidence supports continuous school improvement based on data-centric processes and decision-making owned by the school’s professional learning community of administrators, teachers, and staff. The main processes and strategies are organized in five related domains: (a) data use for continuous improvement; (b) leadership influences; (c) school culture; (d) instructional practices; and (e) professional learning and development. Findings are organized by domain and are related to the themes in the literature review, but offer on-the-ground perspective about implementation of related practices within Central Middle School.

**Data Use for Continuous School Improvement**

Central Middle School implemented the use of student achievement data to support instructional decision making for school improvement over several years. Their implementation was consistent with the five major recommendations made by Hamilton et al. (2009): (a) make data part of an ongoing cycle of instructional improvement, (b) teach students to examine their own data and set goals, (c) establish a clear vision for school-wide data use, (d) provide supports that foster a data-driven culture within the school, and (e) develop and maintain a data system. The overarching goal of the previous principal was to improve student scores by addressing student needs in all populations.
Data use evolved within the school as a means of identifying areas of improvement, setting goals, monitoring progress, and overall school planning. This evidence became the core foundation in decision-making processes related to the operation of the school. CMS uses data in three categories: for operational decision making, scheduling, and placement; for required external reporting; and to evaluate programs and explain and address problematic achievement patterns within the school. These data use categories align with the three common data categories of instrumental, symbolic, and conceptual data categories described by Thompson (1994). Central Middle School recognized that multiple possibilities exist to explain problematic achievement patterns in their school. This school has acquired the ability and capacity to learn from assessment data by developing (a) processes for engaging in conversations around teaching and learning, (b) opportunities for support of analyses of their own data within their school, and (c) shared leadership committed to the endeavor. This closely emulates lessons learned by Murnane, Sharkey, and Boudett (2005) in the use of student assessment results for instructional improvement.

The U.S. Department of Education (2009b, 2010c) lists the most common use of data as school improvement and school planning. Data use practices at CMS extend well beyond typical requirements related to school accreditation and accountability reporting. The findings of this study revealed mature processes for planning, master schedule construction, school activities, and determining how and where resources offered the greatest positive impacts. There was evidence throughout the interviews that this was a continuous and iterative process; the former principal cited Deming’s quality management principle of PDSA as influential and a philosophical foundation when implementing data centric processes within the school.
The student services plan developed by CMS staff formed a central foundation of data and related processes within CMS. The construction of the master schedule was the result of careful data analysis and modeling. The principal and DSS expressed the critical importance of obtaining data about their incoming students in the spring before their arrival at CMS. Incoming student data and course selection information are used to construct a master schedule, but most noteworthy is how CMS used this information to identify students for a summer transition program to prepare them for a strong start in the fall.

The administrative team expressed consistent and constructive views of how data were used at the school as well as their personal use of data in supporting school planning and instruction. Both assistant principals shared the mission and vision established by the former principal as well as the subtle changes brought about by the current principal. The assistant principals were able to clearly articulate their roles related to data use, decision-making processes, and how they supported these activities.

The principal’s desire to identify academic areas of improvement, to expand teaching excellence within the school to better serve all students, and ultimately to obtain a 100% pass rate for the state test was the genesis of the CMS student services planning data tool and related processes. The SSP tool spreadsheets contain standardized test scores, attendance, discipline, assessment data, interim and final quarter grades about each individual student; they also include both team and academic interventions, which form an individual plan and monitoring tool for every student at CMS.

The administrative team was positive and focused on how they used data to make sound decisions that benefit students and the overall reputation and mission of the school. They all independently acknowledged barriers and challenges related to achieving school goals and
implementing interventions, but the story they shared was largely about how their attitudes had changed over time as these data-centric processes matured.

The goals described in the CMS school improvement plan document were consistent with the teaching examples described by participants. Surprisingly, both focus groups shared specific examples of instructional strategies for improving learning by introducing and reinforcing consistent vocabulary. It was clear that both groups understood the goal and the outcome.

**Leadership Influences**

The leadership of school administrators, and specifically the former and current principals, was critical to establishing and sustaining a culture of successful use of data and decision-making processes at CMS. The relationship between the school leadership and support structures that influenced faculty adoption of successful data use practices was multivariable and expected based on related literature (Herman & Gribbons, 2001; Lachat & Smith, 2005). Teacher empowerment for decision making to facilitate change through inclusive leadership and shared responsibilities is supported in findings by Hipp, et al (2008). This empowerment was accomplished at CMS through the development of strong trust relationships. This finding is consistent with shared leadership structures and data cultures that shift accountability from school administrators to teachers, parents, and students Copland (2003). The principal of CMS appeared to exert less role-based authority and instead promoted shared leadership. The principal continued to promote data use by protecting the school’s vision and providing resources to support data inquiry.

The former principal at Central Middle School established a data-centric culture for continuous school improvement over several years. He established a philosophy that data should really drive the decisions that were made at the school and enacted practices to support this
vision. Both former and current principals promoted activities that provide cultural support and motivated staff to use data (Deike, 2009). Most influential, both leaders examined evidence and acted to use data. They investigated multiple explanations for data patterns looking below the surface rather than act on assumptions (Creighton, 2005) allowing better understanding of problems and identification of sound solutions.

The instructional resource teacher is a key consultant to the administrative team and to the teachers. The former IRT was an advocate for instructional data use and provided a communication bridge between instructional practice and administrative goals. She established protocols for small group data analysis and interpretation based on trust and mutual respect and worked tirelessly to promote a culture of shared inquiry rather than individual advocacy.

The assistant principals strongly supported the philosophy and goals of the principal and the school. They demonstrated intense commitment to their instructional teams, to the shared decision-making processes with a focus on data, and the students most in need of interventions. They shared the goal of being not just a great school, but the best middle school.

The principal at Central Middle School views his role as a resource provider and facilitator rather than as a primary decision-maker. His focus is on providing direction and support to his administrators and instructional teams and on removing obstacles and barriers where possible by providing resources and supporting innovative instructional practices. In his first year, he worked to understand the culture of the school and support the ongoing and successful processes rather than implement changes. The principal modeled and reinforced norms for groups by his participation, emphasizing regular meeting attendance. He also introduced formal agendas with time limitations on topics for discussion/decisions to CLTs.
The Director of Student Services and her counseling team are committed to providing effective service programs and constructing a strong academic program. They maintain the student planning data and collaborate with administrative and instructional colleagues in a continuous improvement process. The counseling program has a strong focus on improvement using analysis of student academic and perception (survey) data for instructional and program decisions. This commitment was demonstrated by their interest in, and the school’s alignment with, the National RAMP certification standards.

The school’s leadership created and communicated high expectations of themselves, faculty, staff, and students. The goals and expectations of CMS were consistently communicated via faculty meetings, school newsletters, administrative participation in CLT meetings, and classroom observations. Administrators, the principal in particular, were highly visible and very participatory in the day-to-day instructional activities of the school. Assistant principals led individual boot camp programs for students, which required frequent monitoring and structured remediation opportunities.

CMS has established shared decision-making processes and structures. A leadership counsel of administrators and teacher leaders representing all subject areas acts as the formal decision-making body within the school with a primary focus of improving student performance.

School Culture

CMS has established a culture of evidence-based teaching and learning over several years. Concepts of trust, ownership of success for all students, and high cohesion emerged from all interview sources. Participants presented a strong and unified team approach even as they described their personal responsibilities. CLTs demonstrated mature group dynamics and mutual respect for each other; they also had well-defined meeting norms and decision-making processes.
The collaborative use of data at CMS is positively related to the professional culture, interdepartmental collaboration, shared professional development, time dedicated to collaborative activities, and high teacher expectations of all students, both those high achieving and those at risk of academic failure. This relationship concurs with findings of Wayman (2005). CMS demonstrated a highly positive atmosphere and clearly placed a high value on learning communities for their structural role in supporting academic improvement throughout the school. CLT interviews provided evidence corroborating findings by Hipp, Huffman, Pankake and Oliver (2008); collaborative and productive instructional learning and practice requires a positive, noncompetitive culture high in trust which enables participants to take risks and present ideas openly without fear of personal criticism.

**Instructional Practices**

Booher-Jennings (2005) found that data can drive decisions that target some students for remediation at the expense of other students, which can cause unintended consequences. This study found that CMS does identify or target students for remediation, but that counter balancing programs and instructional emphases exist which benefit all students. Rather than focusing on “bubble kids,” CMS appeared to place equal emphasis on helping students pass the state test and on raising the number or students that pass at the highly proficient level. CMS has been able to increase its pass rate for the state tests, but the school also has raised the pass advance rate, demonstrating that the focus is not only on the lowest achieving students but on all students. These increases may be explained by the use and availability of remediation resources for students at risk of failing the state test, by the relatively small at risk population, or by the innovative teaching practices and high standards and expectations of the teachers at CMS.
Both CLT focus groups demonstrated a strong commitment to continually improving their instructional practice and strongly emphasized the importance of cohesive planning and collaborative innovation. CLT meetings take place on schedule and are used for instructional planning, developing common assessments, reviewing assessment results, identifying problem areas and opportunities, and sharing recommendations. Each CLT has a designated leader and an agreed upon process for making sure decisions are taken, instructional topics are discussed, and tasks are completed. CLT meetings are an instrumental aspect of instructional practice at CMS. CLTs form the basic structure for planning and executing the curriculum by planning lessons and constructing common assessments together. The teachers in each CLT pace the delivery of the lessons and the administration of the common assessments on the same schedule. CLTs felt that this saved time over individual lesson planning and writing tests and benefitted students.

CLT participants provided specific instructional examples of their use of student formative, summative, and embedded assessments; how student achievement data identified by teacher was openly shared and discussed within the team and sometimes at faculty meetings; and the frequency of participation by and support from administrators. These examples parallel all three data classifications provided by White (2007); learning data, teaching data, and leadership data.

**Professional Learning and Development**

As found by Cousins, Goh, and Clark (2006) and Lachat and Smith (2005), the educators involved in school-wide collaborative data use were organized around clearly focused questions and acknowledged the value of data to inform educational practice. CLT focus groups and administrators spoke fluently and confidently about their data use. They expressed a uniform
understanding of how and why CMS emphasizes data. CLT members shared largely positive opinions about the value of using formative and summative assessment data at CMS. CLT participants openly shared viewpoints regarding the downside of relying only on data and on overemphasis or over use of student assessment. The group acknowledged these concerns, offered alternative opinions, and discussed how benefits can outweigh risks. This discussion demonstrated an open culture of inquiry and shared responsibility in the success of the school.

CMS developed a community of learners literate in data, assessment, and pedagogical data-driven decision making as identified by Mandinach, Rivas, Light, Geinze, and Honey (2006). CMS achieved data literacy primarily through professional learning and development within the context of their professional learning community. This is continuous learning which relies on frequent data-centric conversations. It is necessary to continue to build and rebuild capacity internally and externally through benchmarking within teams, between teams, and against other schools and populations. Professional development is ongoing and heavily reliant on sustaining a school-wide commitment to continuous improvement and to continue to cultivate a culture of mutual respect and trust to support positive instructional practices.

**Summary Discussion of Research Questions**

**How Has the Principal of Central Middle School Made the Use of Data an Integral Part of the Operation Within the School?**

The former principal, Nathan, adopted a process of continuous school improvement based on Deming’s quality cycle of Plan, Do, Study, Act. Over a period of five years, he established metrics to measure progress that his faculty and staff could understand and use consistently. Nathan also formalized collaborative structures, CLTs, to support the transfer of knowledge between subject teams. He placed strong emphasis on sharing information and
instructional practices to increase performance of students and teachers together. CMS determines success by the achievements of teaching teams, not individuals. Success within CMS is noncompetitive and teams have a strong responsibility to learn and improve together.

The current principal, Scott, has a strong understanding and respect for the culture of the school. He recognized Nathan as the architect of data at CMS and has built upon what Nathan put in place. Both principals shared similar and highly facilitative philosophies and emphasized their role as principal to set expectations, provide resources, empower CLTs with instructional decisions, monitor progress, and participate in the leadership council.

Data use is integral in the operation of the school because administrators, faculty, and staff believe in the value of using data. This buy-in was established through patience and iterative cycles of planning, trial, evaluation, and adjustments. Student services, with the support of the principal, implemented a tool to support planning and evaluation of their program. CLTs, core teams, counselors, and administrators use the student services planning tool to collect data, monitor students, and recommend interventions.

The primary inputs in designing the school schedule, the annual school improvement plan, after school programs, interventions and remediation, and in determining how funds are spent, are data. The school’s staff members possess a strong expectation that one supports ideas, recommendations, or resource requests with data. The former principal illustrates his perspective of the importance of data at CMS with a quote attributed to Narayana Murthy, the CEO of Infosys, “In God we trust, everybody else bring data to the table” (Clark, 2006).
How Has the Principal of Central Middle School Embedded Data Analysis and Interpretation in the Decision-Making Processes of the School?

Decision making occurs through distributed leadership and specific structures at CMS. CLTs and core teams make instructional decisions. The principal empowers CLTs to lead the instructional cycle of planning, teaching, assessment, feedback, and any necessary corrections. These teams use data from common assessments and formative assessment to support their decisions. Formative assessment techniques are used to determine if re-teaching is required or if weaknesses in content exist.

The director of student services is responsible for overseeing necessary changes to student and staff schedules. The implementation of specific remediation plans for identified students relies on significant class schedule changes as well as changes in teaching schedules. Mid-year schedule changes are decisions based on many types of data, not just grades. Administrators and teaching teams look at student attendance, how students have performed on common and formative assessments, participation in activities, and completeness of homework. Teachers identify and make specific intervention recommendations for students. They take this responsibility seriously and rely on data to identify students and best strategies. Teachers work with students to help them understand and analyze their areas of strengths and weaknesses. The instructional resource teacher and CLT teachers considered this process very important to encouraging students to take responsibility for their own learning. CLT teachers expressed a reliance on data to assure them that they were not missing something and that students were receiving all the instruction they needed to be prepared for state tests.

CMS has a leadership council of teachers and administrators that provides input to the school improvement plan, identifies areas of improvement or school problems, and makes
recommendations for change. This council investigates solutions and makes recommendations based on analysis and interpretation of data.

**How Has the Principal of Central Middle School Engaged Teachers in the Use of Data to Promote Student Learning?**

Shared instructional practices require strong trust relationships to facilitate collaboration, the use and design of common assessments, innovative instructional activities, and successful remediation of students. The current principal trusts and expects CLTs to use data to improve their instructional practice and the achievement of their students. Teachers expressed a concern that if test scores fell, they would have to place greater emphasis on increasing scores and that this would impact their time and energy to innovate instructionally.

Focus groups gave examples of how they worked collaboratively to use consistent vocabulary strategies with students. The science CLT explained that they worked together to make sure that all seventh grade science students were exposed to common academic vocabulary by using shared lessons and making sure that students understood both word meaning and synonyms used in constructing common assessments.

Teachers felt that frequent discussion and sharing information openly with each other benefited their teaching practices and student achievement. CLTs felt that unity and noncompetition between teams and colleagues facilitated communication that improved shared practice. Teachers felt that administrative staff efforts to provide them with common planning time concretely demonstrated commitment to reaching the established goals.

**Surprises**

Throughout all interviews, participants never used the word accountability. The researcher intentionally omitted this term from the interview instruments to better understand
participant perceptions, positive or negative, about their responsibilities related to the use of data; and to reduce the possibility that participants would focus on data use for accountability at the potential exclusion of the researcher’s goal to learn more about how data are used to improve student learning. Participants expressed a clear understanding of the concept of accountability through their interview responses about individual and collective responsibilities to students, collaborative learning teams, and the excellence of the school. They also acknowledged pressures of limited time and high expectations to succeed placed upon them by administrators, the community, and their school’s reputation for excellence.

Time occurs throughout the literature as a common barrier to the use of data. Participants acknowledged that time remains a challenge. One focus group, when asked if common planning within CLTs changed how they spent their time, surprised the researcher with their response. CLT members shared that this practice divided the work and therefore saved time. The science CLT passionately described how they were able to time shift from individual planning to professional learning or even time with family.

The biggest surprise, for this researcher, was the consistency of responses between administrators, staff, and focus groups. Responses between CLTs were highly consistent and on message with the principal and previous principal’s interviews. Principals were aware of negative perceptions by teachers associated with the practice of comparing student scores identified by teachers at faculty meetings. Both administrators considered this a valid concern based on fear of change, and part of the data journey; however, the previous principal reflected that he had been overly ambitious in doing so prematurely.
Implications for Action

This case study of Central Middle School, and its journey as a community of data-influenced learners, yielded several findings of interest to the organization, to school leaders engaged in similar initiatives, and to researchers in the field. It is important to remember that the researcher selected CMS for study because it appeared to be using data for instructional decision making frequently and with purpose.

Based on the findings of this case study, the researcher recommends that principals who seek to increase the quantity and/or quality of data use at their schools should consider the following:

- Evaluate and acknowledge the current state of the school. Identify where improvement is necessary and what processes and structures are working well; evaluate the current school culture; and find the gaps as a basis for goal setting.

- Identify existing school processes that can and should benefit from data use. School improvement planning, curriculum decisions, and placement/grouping of students for instruction or support services are iterative processes that provide collaborative opportunities for staff and classroom teachers.

- Create fidelity to a goal. Work collaboratively with stakeholders to become data focused. The principal’s expectations should be clear, continuously communicated, and understood by the leadership team and throughout the school.

- Acquire and manage the right data. Decide which data elements and procedures will be used and by whom. Principals should consider existing state, district, and school data sources and tools as part of this decision. Data used to improve teaching and which form the core of collaborative instructional discussions and teaching activities should be
relevant and accessible to teachers. The study school used data beyond standardized test scores and grades (Figure 1.) to evaluate the needs of the whole child rather than only academic deficiencies. Data included participation in school activities, attendance, positive discipline, and homework completion.

- Choose a user-friendly technology. It is important that data is appropriate, current, accessible, and easy to view and manipulate. This case study demonstrates that Excel spreadsheets can be an effective tool for data use by counselors, administrators, and teachers. Common spreadsheets were understood and easy for participants to use and update.

- Prioritize and protect time and opportunities for teachers to work with data as learning teams. CLTs in this study identified common time for curriculum planning and construction of common assessments as a requirement for success.

- Team and collaborative data meetings benefit from administrators’ routine participation to reinforce the importance of collaboration and meeting norms which promote open discussion of data within an organizational climate of trust and mutual respect.

- Implement meeting norms for groups for use throughout the school and model use for faculty. Setting ground rules for meeting behaviors form the basis for collaboration. Use agendas with time limits on topics to help ensure that important discussions take place, decisions are made, and team time is used effectively.

- Provide training to improve analytical skills and abilities. Establish a clear purpose for analyzing data, and engage staff collectively to identify and solve problems. Build internal capacity to use data for inquiry and to explore potential solutions and improvements by providing professional development using the teams’ data.
• Decisions to live by. Principals should put structures and processes in place to facilitate decision making by stakeholders. Leadership councils, collaborative teams, and committees are examples. This case study had consistent processes for decision making and opportunities for staff and faculty to lead and participate.

• Build external capacity and professional connections. Both former and current principals in this study benefitted from sharing ideas with other schools and principals. These relationships also generated opportunities for teams to observe, share experiences, and learn from teams at other schools.

• Communicate progress toward goals and deficiencies by visually displaying data at whole faculty meetings. This increases exposure and reinforces data use goals and expectations. Although the study school identified data by individual teachers at faculty meetings, sharing such data within CLTs would be a more appropriate initial step.

• Use data with students to identify areas of strength and improvement. Data use for student feedback and parent communication is beneficial, but are the least typical use of local data (U. S. Department of Education, 2010c). CLT members discussed common assessment test items with students in class or small groups if more than 75% - 80% of the class answered the item incorrectly.

• Empower teachers to make instructional decisions based on collaborative data analysis. This case study highlighted the ownership and responsibility of student achievement and success by teachers.

• Success is a team sport. Principals should evaluate how they value and reward performance and success at their schools. If collaboration is truly valued, praise and reward should focus on collaborative efforts and not on individual achievement.
Recommendations for Future Research

This study was at a high achieving middle school that had implemented collaborative learning teams as part of the larger school professional learning community. CMS provided examples of mature collaborative teams and decision-making processes which relied on data input, analysis, and interpretation. This school’s journey began over five years ago, so the most mature CLTs of the school have well-established data use practices.

While many practitioner articles and studies exist about data-driven decision making and assessment, the integration of a holistic data model within a school model appears unusual. Future research may include replicating this study at the high school and elementary level to explore how and what data elements are important in instructional and operational decision making. Another variation might be to explore potential functional differences and challenges of CLTs at the high school level. It could be beneficial to interview and observe less mature CLTs within the same culture to gauge maturation. Finally, it might be helpful to explore how the CMS model might scale within the district if similar structures were put in place.

Conclusions

The review of literature, research, and results of this case study highlight the value and importance of a professional learning community in implementing and sustaining a positive data culture to promote student learning. There are no quick wins, and success is based on an iterative process (Figure 2.) supported by dedicated leaders and a committed community of professional learners who define innovative teaching and learning and continue to contribute to sound instructional decision-making processes within the school.

Developing a culture of trust requires time and patience from administrators and teachers, facilitated by unwavering leadership. Trust is a two-way relationship based on commitment and
shared goals. The overarching goal at CMS is to improve their school by continuously learning and working closely together. Achieving goals that raise the achievement of all students requires strong commitments by teachers who value team success over their own individual success. CMS really exemplifies the concept of shared ownership for the learning of all students and not just those students on their class roster. These foundational concepts, captured in this study, are required for success, must be developed and consistently nurtured, and cannot be dictated.

A national education trend toward growth models, tracking individual student progress over time, was not included in NCLB but has evolved over time (Ravitch, 2010). This is a method of measuring academic improvement also known as value added assessment (VAA). VAA results are often reported by individual teacher records and have implications related to teacher evaluation, tenure, and performance pay. VAA has also introduced a greater emphasis on the use and development of longitudinal educational data systems which feed that model. This can introduce political tension within districts, since disaggregated data, most useful at the local school level, may include data elements located in disparate systems. Providing these data elements in user-friendly data tools for local school use may be of lower priority than district or state reporting systems, especially when resources and budgets are restricted.

Value added models may introduce increased competition between teachers and could result in decreased incentive to share instructional practice, emphasis on achievement by individuals over teams, and an erosion of collaboration and trust. A value added model that emphasizes student results associated with teacher evaluation is likely to promote self-accomplishment over shared mission and goals. Such a model is likely to close classroom doors and decrease collaboration. This could be detrimental to student success, positive school culture, and innovative teaching strategies such as those implemented at CMS. Mature professional
learning communities have demonstrated resilience to culture change, however, strong advocacy by educators, leadership by principals, and engagement by division superintendents are the best defense against potentially negative effects of a value added model.
References


SETC Presentation CMS (October, 2008) Presentation at State Ed Tech Conference


Appendix A

Informed Consent for Participants

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
Informed Consent for Participants in Research Projects Involving Human Subjects

Title of Project: Data focused decision-making: One School’s Journey

Investigator(s) William J. Glenn and Sandra A. Kretzer

I. Purpose of this Research/Project
The purpose of this study is to describe how actions of school leaders influence the use of data in a school. The principal, former principal, staff, and teachers will be included in the study. Information gained from the study will be made available to the school to inform their professional development and learning activities.

II. Procedures
The following activities will take place to complete the study: an interview with the principal, former principal, guidance director, school based data specialist, and selected team teachers; observations of data use and discussions during meetings, during and outside of the regular school day, and a review of documents. The principal’s interview is expected to be from forty-five minutes to one hour in duration; the focus group interview is expected to be approximately one hour for each of two groups. Copies of the interviews and the transcriptions will be shared with the interviewees. The observations will be unobtrusive to the learning environment.

III. Risks
There are expected to be minimal risks to the participants in this study. Staff members who do not want to participate may opt-out of the process.

IV. Benefits
There is no guarantee of benefits associated with this study. The use of data to inform school based decisions has appeared consistently in discussion of effective school leadership and the direct benefit of studying the characteristics of the principal’s and other school leader’s roles in data use can benefit the school and other principal’s in schools.

V. Extent of Anonymity and Confidentiality
Pseudonyms will be used to preserve the confidentiality of the participants. The principal interview and the focus group interviews will be digitally recorded in order to have accurate transcriptions. These recordings will be stored at the home of the investigator during the data collection process, given to the committee chair to store for 5 years, and destroyed at the end of the study. Transcriptions will be shared with the principal and the focus group to determine accuracy.

VI. Compensation
There is no compensation associated with participation in this study.
VII. Freedom to Withdraw
The principal, staff, and focus group members are free to withdraw from this study at any time without penalty.

VIII. Subject’s Responsibilities
I voluntarily agree to participate in this study. I have the following responsibilities:
Complete the interview

IX. Subject’s Permission
Virginia Tech Institutional Review Board: Project No. 10-727
Approved 11/3/2010 to 11/2/2012

I have read the Informed Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge the above and give my voluntary consent:

Chair, Virginia Tech Institutional Review
Board for the Protection of Human Subjects
Office of Research Compliance
2000 Kraft Drive, Suite 2000 (0497)
Blacksburg, VA 24060

_____________________________________________ Date ___________
Subject Signature

_____________________________________________ Date ___________
Witness (Optional except for certain classes of subjects)
Should I have any pertinent questions about his research or its conduct, and research subjects’ rights, and whom to contact in the event of a research-related injury to the subject, I may contact:

Sandra A. Kretzer 703-978-2358 / sandk07@vt.edu
Investigator(s) Telephone/e-mail

Dr. William Glenn 703-538-8493 / wglenn@vt.edu

__________________________________       ________________________
Departmental Reviewer/Department Head       Telephone/e-mail

David M. Moore 540-231-4991 / moored@vt.edu
Chair, Virginia Tech Institutional Review Telephone / e-mail
Board for the Protection of Human Subjects
Office of Research Compliance
2000 Kraft Drive, Suite 2000 (0497)
Blacksburg, VA 24060
Appendix B

Guiding Questions for Principal Interview

1. Your school is known as a model for the use of data within the district. Can you tell me more, from your perspective, about how data is used to identify and plan for change in your school?
   a. Staffing/Hiring
   b. Programs
   c. Scheduling
   d. Budgeting
   e. Resources

2. Within your school, what processes do you consider dependent on data?

3. How would you describe your role as a leader with regard to attaining student achievement goals? (Does your role vary?)

4. How would you describe the culture of data use within your building/school?

5. Can you describe how issues or areas of improvement are identified in your school?
   a. How are these issues communicated?
   b. Who is involved in solving issues/problems?

6. To what degree do faculty and staff interact with data at your school?
   a. Collecting
   b. Analyzing
   c. Using data to identify school needs

7. What are your expectations with regard to how faculty and staff interact with data to improve their practice?
8. What structures and/or policies are in place to support continuous instructional improvement?

9. With regard to instructional decisions, who is involved and to what degree?

10. How is data used to develop, implement, and monitor the school improvement plan?

11. What information do you consider critical to the successful operation of your school?
Appendix C
Guiding Questions for Staff Interview

1. Your school is known as a model for the use of data within the district. Can you tell me more, from your perspective/roll, about how data is used at your school?
   a. Programs
   b. Scheduling
   c. Planning
   d. Monitoring
   e. Reporting
   f. Assessment
   g. Resources

2. How was the topic of data and electronic assessment introduced to you?

3. What kinds of training/staff development in data use and assessment practice have been offered to you and others at this school? Is training ongoing?

4. How would you describe the data culture within your building?
   a. Information and data sharing
   b. Collaboration
   c. Decision Making

5. What types of data do you access and how do you use the data?
   a. Student records
   b. Demographics
   c. Results data
   d. Process data
6. What data tools/systems do you interact with most frequently?

7. What would you describe as changes to student learning that you feel are related to the use of data?

8. How have your skills and/or perspective changed since joining this school?

9. What do you feel are the biggest challenges related to using data?
   a. Collecting
   b. Analyzing
   c. Implementing changes

10. What would you consider to be benefits of engaging in data and assessment activities?

11. How are activities related to the analysis, use, and discussion of data supported by your school’s leadership?

12. How would you describe the expectations of you and your colleagues related to using data to promote student learning?
   a. How are these expectations communicated to you?
Appendix D

Guiding Questions for Focus Group Interview

1. How would you describe your role in identifying issues and problem solving as it relates to your areas of responsibility?

2. Can you describe how and when conversations related to curriculum and student progress occur? (Who is involved, frequency)

3. What do you believe are the values or positive outcomes of engaging in data and assessment activities?

4. What challenges do you face related to the use of data to promote student learning?

5. How are collaborative planning activities and conversations supported?

6. How have team meetings/planning periods changed over time?

7. How are administrators (principals) involved in program and instructional decision making?

8. What do you feel is expected of you by the principal related to the use and analysis of data?

9. How are these expectations communicated to you?

10. What advice do you have for other teachers/teams that are implementing data use and assessment processes?
Appendix E

Guiding Questions for Former Principal Interview

1. In your previous role as principal, your school was identified as a model for the use of data within the district. Can you tell me, from your perspective, about how data was used within the operation of the school?

   f. Staffing
   g. Programs
   h. Scheduling
   i. Budgeting
   j. Resources

2. As a principal, what processes did you consider dependent on data?

3. How would you describe your journey as a leader with regard to attaining student achievement goals?

4. How would you describe the culture of data use you established at your previous school?

5. Can you describe how issues or areas of improvement were identified/prioritized in your school?

   a. How were issues communicated?
   b. Who was involved in solving issues/problems?

6. Who interacted with data at your school?

   a. Collecting
   b. Analyzing
   c. Using data to identify school needs
7. What expectations/priorities did you communicate to staff with regard to how they interacted with data to improve their practice?

8. What structures were in place to support continuous instructional improvement?

9. How was data used to implement and monitor the school improvement plan?

10. What recommendations or advice do you have for administrators that are implementing processes of data use and assessment within their schools?
Appendix F
Interview Request

Dear [Principal],

I am interested in learning about the use of data to inform instructional decisions and the leadership skills that are necessary to develop and sustain data practices. With regard to your school, I am specifically interested in how data is used for operational, decision making, and instructional activities within your school. Related to data use, I am interested in learning about how you and your staff embed the use of data analysis and interpretation and engage teachers in the use of data to improve student learning.

In addition to interviewing you, I would also like to interview members of your staff who are engaged in guiding and supervising the use of data for instructional decisions within your school. Each individual interview will take approximately 45 minutes. I would like to conduct two focus groups with team teachers during non-instructional time (45 – 60 minutes). Pending your suggestion and approval I would like to have the opportunity to observe planning activities related to how data is used in your school. Each interviewee will be provided with a written copy of the interview questions. I will be recording each interview in order to have an accurate transcription. Each participant will be given a copy of the transcript to check for accuracy.

I have attached a copy of each interview protocol for your review.
### Appendix G

**Fair Use Checklist**

DRAFT Fair Use Checklist adapted from the Copyright Management Center at IUPUI [http://www.copyright.iupui.edu/checklist.htm](http://www.copyright.iupui.edu/checklist.htm) (accessed Oct 28, 2008). See also the University of Minnesota’s “Fair Use Analysis Tool” at [http://www.lib.umn.edu/copyright/checklist.phtml](http://www.lib.umn.edu/copyright/checklist.phtml)

School Improvement Framework Conceptual Model: Government of Western Australia, 2008

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<th>In Favor of Copyright Holder (not fair use)</th>
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| **Nature of the Copyrighted Work** | | |
| character of the work | | |
| for example, fact or fiction | | |
| worthy of (extensive) protection? | | |
| X | X | |
| Published work | Unpublished work | |
| Factual or non-fiction based | Highly creative work (art, music, novels, films, plays) | |
| Important to favored educational objectives | Fiction | |

| **Amount and Substantiality** | | |
| use only what’s necessary quantity and quality in relation to the whole work | | |
| X | X | |
| Small quantity of the work | Large portion or whole work used | |
| Portion used is not central or significant to entire work | Portion used is central to work or “heart of the work” | |
| Amount is appropriate for favored educational purpose | | |

| **Effect** | | |
| harm to potential market or value of a work after a portion has been used separately from the whole | | |
| X | X | |
| User has lawfully acquired copy of the original work | Could replace sale of copyrighted work | |
| One or fewer copies made | Significantly impair market or potential market for copyright work or derivative | |
| No significant effect on the market or potential market of copyrighted work | Reasonably available licensing mechanism for use of the copyrighted work | |
| No similar product marketed by the copyright holder | Affordable permission available for using work | |
| Lack of licensing mechanism | Numerous copies made | |
| You made it accessible on Web or in other public forum | Repeated or long term use | |

DRAFT NOV. 12, 2008: Gail McMillan, Digital Library and Archives

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## Figure 1. Central Middle School’s Student Services Planning Tool – Data Elements

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Figure 2. Model of Data Use for Continuous School Improvement at Central Middle School. Adapted from “The School Improvement and Accountability Framework-conceptual model p.3, 2008”: Copyright 2008 by Department of Education, Western Australia. Fair Use Determination Attached.