AN EXAMINATION OF THE PERCEPTIONS OF TEACHERS, ADMINISTRATORS AND INSTRUCTIONAL SUPPORT STAFF ABOUT THE USE OF DATA TO GUIDE INSTRUCTION IN A CATHOLIC DIOCESE, IN THE NORTHEASTERN UNITED STATES

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ABSTRACT

AN EXAMINATION OF THE PERCEPTIONS OF TEACHERS, ADMINISTRATORS AND INSTRUCTIONAL SUPPORT STAFF ABOUT THE USE OF DATA TO GUIDE INSTRUCTION IN A CATHOLIC DIOCESE, IN THE NORTHEASTERN UNITED STATES

Michael Connell

Educators have an abundance of student data available to guide their instructional decisions. Federal and State legislation has repeatedly incorporated accountability measures to ensure learning equity. Current research revealed that effective data use in the classroom to guide instructional decisions requires a complex network of resources, supports, and practices. This quantitative research study, informed by Sociocultural Theory, investigated teachers, administrators, and instructional support staff perceptions regarding teachers' use of data to support instruction, their attitudes toward data, and the supports that help teachers use data. The study was conducted in one suburban Roman Catholic Diocese in the Northeastern United States consisting of 39 elementary schools with a student enrollment of 12,801. In total, 969 teachers, 51 administrators, and 39 instructional support staff were invited to participate. The study analyzed results from the Teacher Data Use Survey (TDUS). The survey yielded response rates from teachers (16.3%), administrators (39%), and instructional support staff (10%). Cronbach alpha statistics for each scale were calculated at 0.94 or higher. Descriptive survey analysis revealed that all three subgroups identified that Iowa Assessment data was the most available yet the least frequently used. Classroom performance assessment data was used the most frequently by teachers for all instructional practices. Positive correlations were

identified between scale means including Data Competence with Data's Effectiveness for Pedagogy (r (158) = .618, $p < .05$), Principal Leadership (r (158) = .495, $p < .05$), Principal Leadership with Data's Effectiveness for Pedagogy (r (158) = .492, $p < .05$), Computer Data Systems (r (158) = .548, $p < .05$), Data Competence, and Collaborative Team Trust (r (158) = .350, $p < .05$), Computer Data Systems with Data Competence (r (158) = .333, $p < .05$.), and Data's Effectiveness for Pedagogy (r (158) = .248, $p < .05$). Implications for future research include examining the relationships between teacher self-efficacy in data competence, collaborative team trust and actions, principal leadership, data's effectiveness for pedagogy and computer data systems. Implications for future practice includes considerations for effective professional development and the establishment of systematic, structured time to support a strong data culture.

DEDICATION

Without the love of my family, I would never have been able to complete this journey. This project is dedicated to all of you. You may not know it, but your encouragement, love, support and confidence in me is what has motivated me to see this project through to the end.

professional relationship that we have developed is something that I cherish and am hopeful

continues long after the ink has dried on this project.

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CHAPTER 1: Introduction

"Educators face a moral obligation: to act on the best evidence-based practices that will ensure that record proportions of students receive a quality education," (Schmoker, 2018).

Data-driven decision making is a broad tool that educators at all levels of an organization can practice in order to ensure that every student is truly receiving a quality education (Mandinach & Jackson, 2012). Data-driven decision making is a process whereby, "…educators examine assessment data to identify strengths and deficiencies and apply those findings to their practice," (Mertler, 2014). However, more research is needed to better understand teachers use of data to inform instructional decisions, as well as, identifying gaps of understanding between administrators, teachers and instructional support staff in order for this evidenced based practice to have the greatest impact on student learning (Marsh & Farrell, 2015b; Matters, 2006; Schifter, 2014; C. S. Wayman Jeffrey, Shana; Cho, Vincent, 2017).

Catholic schools are not immune to this call for data-driven decision making. In a highly competitive market to attract new students and retain existing students, Catholic schools are increasingly aware of their responsibility to ensure that every Catholic school graduate is poised to succeed upon graduation. Catholic school educators, administrators and parents know that their students will be held to the same high standards when competing against their public-school counterparts for post-secondary options (Niemeyer, Casey, Williamson, Casey, Elswick, Black, and Winsor, 2016).

Data-driven decision making and its adoption by education professionals on their journey for using evidence to make decisions is not new. The Institute of Education Sciences (IES) was created in 2002 as a research branch of the Department of Education (Mandinach & Jackson, 2012). The mission of the IES is to provide scientific evidence on which to ground education practice and policy so that this information can be shared with educators, parents, policymakers, and the public (IES, 2019). The IES was created by the Education Sciences Reform Act of 2002 (ESRA) to measure the effectiveness of federal and other education programs ("Education Sciences Reform Act of 2002," 2002). With the creation of the IES, a clear message was sent to the educational research community that it must evolve into an evidence-based discipline (Mandinach & Jackson, 2012).

This journey for rigor within the educational research community manifested into a change in expectations for K- 12 schools (Fullan, 2017). Initially, this change in expectation flowed into classrooms in the name of accountability and compliance through federal legislation. (Dunlap & Piro, 2016; Mandinach & Jackson, 2012; Wayman, 2015). As Congress was legislating changes in the educational landscape to support research of evidence-based practices, then newly elected President George Bush announced in January 2001 *No Child Left Behind*, which called for bi-partisan education solutions based on accountability, flexibility and choice. This reformation in educational law and funding addressed concerns regarding the progress of student learning and the inherent costs associated under the Elementary and Secondary Education Act of 1965. The NCLB Act sought to increase accountability by requiring state governments to implement state-wide accountability systems to measure learning (NCLB, 2001).

Accountability and compliance continued to drive data use during this early stage of development. Margaret Spellings, the Secretary of Education in the Bush Administration until January 2005, believed that information was the key to accountability in education. Data is the best management tool to measure performance, identify successes and prescribe solutions to problems. Data can help teachers and administrators evaluate learning at all levels of education because of the criteria established in NCLB (Mandinach & Jackson, 2012).

During subsequent executive administrations, politicians and policy makers have continued to legislate accountability within education. Data driven decision making was included as one of the four pillars of the American Recovery and Reinvestment Act of 2009 (Schifter, 2014). Arne Duncan, the Secretary of Education during the Obama Administration, identified a shift from data for accountability toward data for continuous improvement (Mandinach & Jackson, 2012; Schifter, 2014). Secretary Duncan believed in the power of data to inform decisions and that the best teachers use real time data in ways that were not imaginable as recent as the year 2000. He posed that teachers desire to know exactly what they need to teach and how to teach it. This is possible by incorporating data-driven decision making into instruction on a regular basis (Mandinach & Jackson, 2012).

In 2015, the Obama Administration enacted *Every Student Succeeds Act* (ESSA, 2015). ESSA continues to promote accountability and continuous improvement. Highlights of ESSA include provisions that maintain an expectation that there will be accountability and action to effect positive change in our lowest-performing schools, where groups of students are not making progress, and where graduation rates are low

over extended periods of time. Additionally, ESSA ensured that vital information was provided to educators, families, students, and communities through annual statewide assessments that measure students' progress toward those high standards (ESSA, 2015).

Making the case for teachers to acquire data literacy, Secretary Duncan challenged schools of education for teacher preparation to make sure that new educators entered the profession with an ability to use data-driven decision making to impact daily instruction. Data literacy and the accompanying data use skills are required to meet the changing landscape of the twenty-first century classroom. Students are expected to demonstrate complex abilities like applying critical thinking, creativity, collaboration and communication to solve complex problems. As education continues to shift toward continuous improvement, new methods of understanding student development are being created.

The Partnership for Assessment of Readiness for College and Careers (PARCC) and the SMARTER Balanced Assessment Consortium are examples of these new methods aimed at understanding student achievement. Data-Driven decision making is a byproduct of this continuous improvement mindset (Mandinach & Jackson, 2012). "The philosophical shift gives educators the license to use data to help all students by identifying the cognitive and affective strengths and weaknesses, thereby making individualized instruction possible," (Mandinach & Jackson, 2012).

Teachers can employ new information about student learning, inform their daily lesson planning, and ultimately create improvement strategies for all students through the use of data driven decision making (Wayman, Wilkerson, Cho, Mandinach, & Supovitz, 2016). Effective use of student data by teachers requires a multifaceted network of

actions, attitudes and supports. Data use should follow an inquiry cycle that involves the naming of a problem, the development of a hypothesis regarding improvements to learning, data collection and analysis and finally forming action steps (Dunlap & Piro, 2016; Mertler, 2014; Wayman et al., 2016).

While teachers have historically used data intuitively in their instructional decisions, they have not incorporated data resulting from the administration of standardized tests. There is a gap between the old tools of the professional teacher, like intuition, teaching philosophy and experience from the new tools of educational assessment like data analysis based on multiple forms of assessment. This new approach tends to be systematic rather than intuitive (Mertler, 2014). Understanding the data use practices, attitudes, and supports of teachers embedded within their instructional process is the purpose of this study.

Using data to inform instruction is a best practice that is not only reserved for public education. The National Catholic Education Association (NCEA) advocates for Catholic schools to effectively use student performance data to improve instructional decisions in the classroom. A recent report released by the NCEA highlighted the efforts of one diocese in their quest to establish a common direction for applying data to improve the instructional practice across their schools (Mara, 2017).

In 2012, The United States Catholic Council of Bishops (USCCB) published the National Standards and Benchmarks for Effective Catholic Elementary and Secondary Schools (NSBECS). This project utilized research-based school effectiveness criteria, as well as criteria unique to Catholic school mission and identity to guide and assess PK – 12 Catholic school effectiveness (USCCB, 2012). Using data to improve curriculum and

instruction is well established throughout the standards and benchmarks. The standards are designed to describe policies, programs, structures and processes that should be in place. The benchmarks identify observable, measurable descriptors to validate practices (USCCB, 2012).

NSBECS Governance and Leadership Standard Six identifies that an excellent Catholic school has a qualified leadership team to realize and implement the school's mission and vision. This standard is supported by Benchmark 6.1 which states, "The leader/leadership team directs the development and continuous improvement of curriculum and instruction, and utilizes school-wide data to plan for continued and sustained academic excellence and growth," (USCCB, 2012).

NSBECS Academic Excellence Standard Seven requires Catholic schools to have clearly articulated, rigorous curriculum aligned with relevant standards, 21st century skills, and Gospel values, implemented through effective instruction. Standard seven is measured through benchmarks which inherently require data rich practices. For example, Benchmark 7.3 requires curriculum and instruction which fosters 21st learning skills, including developing students to become creative, reflective, critical and moral evaluators, decision makers and responsible global citizens (USCCB, 2012). Benchmark 7.7 requires faculty collaboration in professional learning communities to develop and implement continuous improvement of curriculum and instruction (USCCB, 2012). The development of faculty collaborative processes, curriculum and instructional improvement, and fostering 21st century learning skills require a data savvy team of educators (Lewis, 2019; Mertler, 2014).

NSBECS Academic Excellence Standard Eight places an emphasis on school wide assessment methods and practices to document student learning and to inform the continuous review curriculum and improvement of instructional practices. Benchmark 8.1 requires a systems approach to utilizing school wide and individual student data generated by a variety of tools to monitor, review and evaluate curriculum and instruction for sustained student growth. Benchmark 8.2 identifies the practice of aggregating student data and includes the practice of transparent stakeholder sharing. Benchmark 8.3 identifies that faculty must use a variety of curriculum-based assessments aligned with learning outcomes and instructional practices to assess student learning (USCCB, 2012). Using data to improve teachers' instructional practice within Catholic schools is an important component of the continuous improvement cycle called for throughout the literature.

The impacts of the National Standards and Benchmarks for Effective Catholic Elementary and Secondary Schools (NSBECS) are being studied to determine their effects toward producing highly effective Catholic schools. One recent multi-phase study conducted sought to examine the impacts of the NSBECS through two national surveys. Results and subsequent analysis showed that the NSBECS can be a vital framework for assessing and improving Catholic school effectiveness (Ozar, Weitzel – O'Neill, Barton, Calteaux, and Yi, 2019).

This research study examined teacher data practices, their attitudes toward data, and the supports available to teachers within a Catholic elementary system of schools. The data sources included in this study were representative of annual standardized assessment data, periodic assessment data, locally created assessment data, and personal

teacher created assessment data (C. J. Wayman Jeffrey, Margie; Wilkerson, Stephanie, 2017). Specifically, this study investigated the data used by teachers from Iowa Assessments (annual standardized assessments), interim benchmark assessments (periodic assessments), school developed assessments (locally created assessments), and classroom performance assessments (personal teacher created assessments). This study also investigated the perceptions of administrators and instructional support staff regarding their perceptions of teacher data use. This research study answered the following questions:

1. To what extent do teachers use data to support instructional decisions?
2. To what extent do the following components impact teachers use of data to support instructional decisions?
    a. Teacher competence in using data
    b. Teacher Attitudes toward data
    c. Teacher collaborative team trust
    d. Organizational supports for teacher data use
3. How do administrators and support staff view teachers use of data to support instructional decisions?

Findings from this study have added to the current body of research and may help school leaders plan, develop and utilize student data to improve learning for all students. Additional implications resulting from this study may include targeting critical resources to improve data use practices and identifying focused areas of professional development for teachers, administrators, and instructional support staff.

Purpose of the Study

The purpose of this quantitative research study was to examine the practices of teachers regarding their use of data driven instruction in an elementary system of schools in a suburban Catholic diocese in the Northeastern United States. Specifically, the study investigated teachers, administrators, and instructional support staff regarding teachers' use of data to support instruction, their attitudes toward data, and the supports that help teachers use data. The study employed the Teacher Data Use Survey (TDUS), created for the Institute of Educational Sciences to measure this information. The Teacher Data Use Survey (TDUS) was customized for teachers, administrators and instructional support staff to collect information regarding teacher data use based on the provisions previously established through the research (Wayman et al., 2016; Wayman, Johnson, & Wilkerson, 2017; Wayman, Johnson, Cho, Mandinach, & Supovitz, 2017).

Theoretical and Conceptual Framework

Data driven decision making is an evidenced based practice which must be rooted in a scientific approach (Mertler, 2014). Ironically, current literature indicates a lack of theoretically driven research in the realm of data driven decision making which would, "…enable deeper understanding of the dynamics between educational interventions and on the ground responses and actions," (Marsh & Farrell, 2015b).

Applying Sociocultural Theory when considering how to best support teachers in their use of data driven decision making would benefit educational administration and instructional leaders (Marsh & Farrell, 2015b). Learning is inherently a social phenomenon where individuals make sense of information and construct new knowledge

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based on prior beliefs, attitudes, knowledge, and experiences including social interactions in everyday activities (Schunk, 2016; Vygotsky, 1978). Understanding teacher data use practices to identify learning needs and other district interventions to improve teacher practice is a meaningful application of this theory (Marsh & Farrell, 2015b).

This study was grounded in Sociocultural Theory as it applies to the understanding of the practical and abstract intelligence required for the merging of the art and the science of data driven decision making within a system of schools (Mertler, 2014; Vygotsky, 1978). The conceptual framework presented within this study is illustrated in Figure 1.

"The most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously completely independent lines of development, converge, " (Vygotsky, 1978).

Sociocultural theory assumes learning is embedded within social events. To understand development, it is necessary to know how individuals participate in everyday, authentic activities involving their peers, their actions and associated artifacts (Marsh & Farrell, 2015b; Vygotsky, 1978). Vygotsky's Sociocultural theory places an emphasis on the social environment as a facilitator of development and learning. A teacher or more knowledgeable other is critical in supporting learning through discourse, modeling, scaffolding and collaboration (Marsh & Farrell, 2015b; Schunk, 2016; Vygotsky, 1978).

Figure 1

Conceptual Framework of Data Driven Decision Making
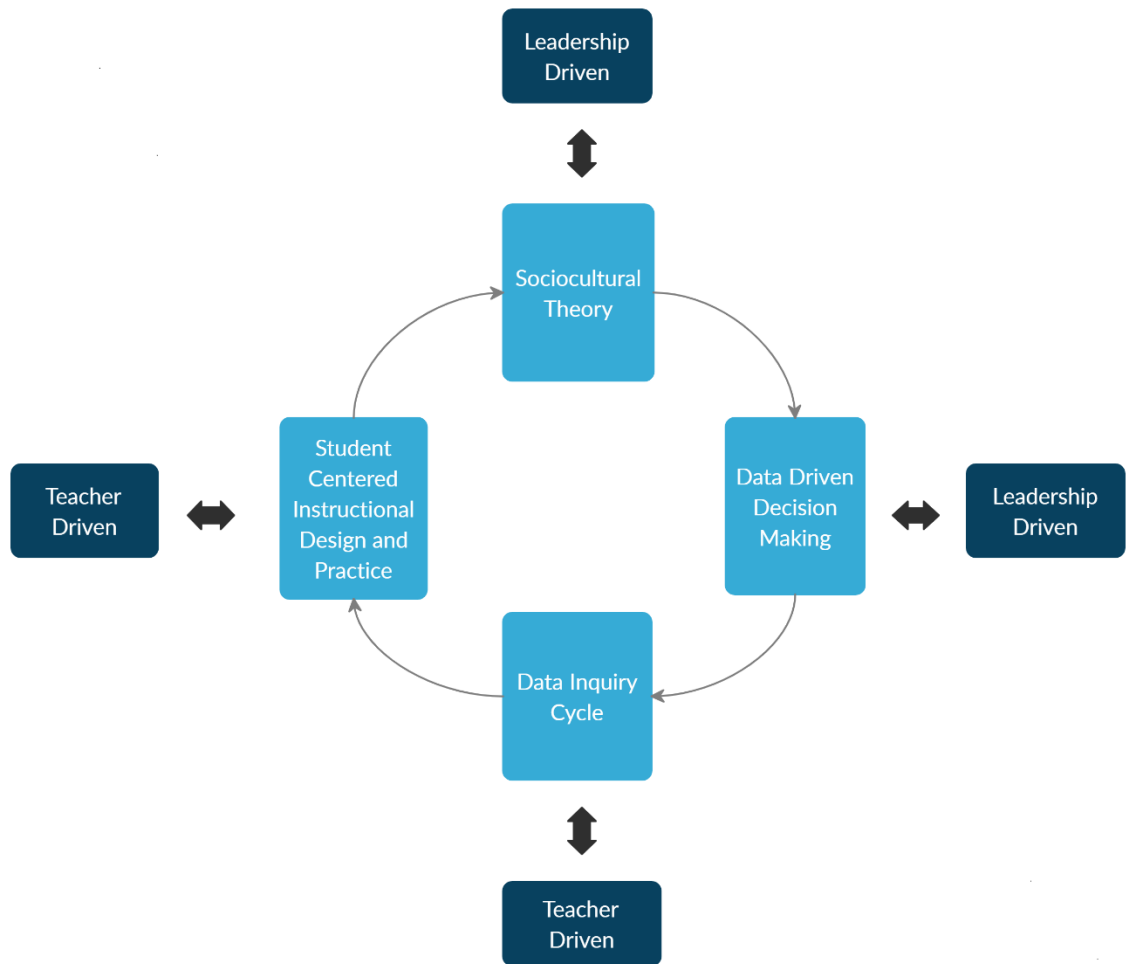
Sociocultural theory contends that as learning occurs through a shared language between the apprentice and expert, a new understanding is created (Vygotsky, 1978). Discourse, modeling, scaffolding and collaboration create opportunities for teachers to rely on each other to complete tasks and forces them to bare their practices publicly. This interaction provides opportunities to create a shared technical language and agree on sound practice (Wei, 2009).

Applying sociocultural theory to understand school improvement efforts is well established in the research (Marsh & Farrell, 2015b). In practice, it is important to be cognizant of three insights regarding the application of this theory. First, researchers argue that sociocultural theory is an underdeveloped and necessary area of study. Second, learning actions such as discourse, modeling, scaffolding, collaboration and authentic practice are important components associated with sociocultural theory. A reciprocal relationship exists between the learner and the knowledgeable other, which in many cases is the school leader (Marsh & Farrell, 2015b). This research study highlighted the relationships inherent between the tenants of sociocultural theory with existing research regarding data driven decision making and the data inquiry cycle to lead educators toward a wholly student-centered instructional design and practice.

As a field of study, teacher capacity for data driven decision making is evolving (Mandinach & Jackson, 2012; Marsh & Farrell, 2015b). The importance of leadership for the development of a data driven decision making culture must be recognized. Current research regularly identifies leadership at the school level as one of the most important factors in developing this skill base (Mandinach & Jackson, 2012; Marsh & Farrell, 2015b; Wayman, Jeffrey, & Cho, 2017).

Student centered instructional design and practice is an overarching priority in education. This instructional format most accurately can be defined as systematic, tailored instruction for each student including informed curricular design and identifying best practices that meet each student at their most pressing instructional need (Danielson, 2007). A student-centered learning climate can have profound effects on student motivation and engagement with classroom instruction (Byrk, 2010). Informed curricular

design and the identification of best practices for each student occur as a result of data driven decision making.

In order to establish a school culture steeped in student centered instructional design and practice, a framework of supports for data driven decision making must be established. A school leader establishes a professional culture of teacher development by regularly employing the following components required for learning established in Sociocultural Theory: (a.) scaffolding, (b.) modeling, (c.) collaborative learning, (d.) professional discourse. A school leader establishes the professional culture of data driven decision making by creating the data vision, data culture, technology and data tool infrastructure of a school community (Sun, Przybylski, & Johnson, 2016). The school leader accounts for the structured time required for teachers to participate on data teams and the professional development required for teachers to develop data literacy. Through professional discourse and collaborative learning teachers will embrace the efficacy of data teams and seek to establish high levels of data literacy throughout the school community. Inherently, this cycle of development will move school communities toward their overarching goal of establishing a student-centered instructional design and practice.

Student-centered instructional design may be manifested through a cycle of data inquiry. Data inquiry is the evidenced based practice by teachers that seeks to use student data to establish instructional hypotheses, develop instructional interventions, gather and analyze additional performance data so that the cycle can continue to be replicated (Mandinach & Jackson, 2012; Mertler, 2014). This cycle of inquiry allows teachers to identify the critical learning elements and design an instructional plan to meet each student's needs.

Student-centered instructional practice may be manifested in conjunction with the cycle of inquiry identified in the design and planning process. Teachers establish learning plans geared for whole class instruction. Student performance data is used to further delineate student learning needs. Learning activities can be targeted for smaller group instruction within the whole classroom. From the information gathered during small group instruction, teachers can then further identify needs and instruct students based on the individual needs (Danielson, 2007).

Significance of the Study

A high-level use of data driven decision making in a school establishes that data is used for systematic, tailored instruction for each student, to inform curricular design and identify and develop best practices (Sun et al., 2016). Research regarding the connection between data driven decision making and improved student learning outcomes is inconclusive (Mandinach, Rivas, Light, Heinze, Honey, 2006; Sun et al., 2016). Much of the early research in this emerging field has consisted of qualitative studies while only a relatively few studies have attempted to quantify data use (Sun et al., 2016; Wayman Jeffrey, & Cho, 2017).

This study has extended the existing body of research regarding teacher data use, examined the importance of leadership and instructional support staff on teacher data use, and documented one specific system of school's progress within the continuum of developing communities of data driven decision makers.

Connection with Social Justice and Vincentian Mission in Education

Data use accountability policies have intensified the use of data to highlight differences in achievement across racial, linguistic and income groups. Data use could be an important mechanism for achieving equity in education and minimizing the educational debt (Datnow and Park, 2018).

Ladson-Billings (2018) described educational debt as the historical, economic, sociopolitical, and moral components which have continued to sustain the achievement gap prevalent in education. Educational debt expands stakeholders' accountability to provide all students access to educational resources which allows them to achieve at a high level (Datnow and Park, 2018). Specific practices can either "open or close doors for students" based upon the lens with which leaders understand and utilize data in schools. Researchers have identified the intertwined relationship between student assessment data use for the purposes of accountability or for continuous improvement (Datnow and Park, 2018; Hackman, Malin, and Ahn, 2019).

Datnow and Park (2018) investigated a conceptual framework to understand the implications of this described tension between data use practices for accountability or for continuous improvement. Datnow and Park (2018) explored how the doors of equity are either opened or closed by specific data use practices. The researchers examined the relationship of team data meetings in schools for instructional improvement and administrative compliance, the relationship between using data to confirm assumptions or to challenge systemic beliefs about student subgroups, and the relationship between using data for student tracking or to develop flexible grouping to promote student growth.

Incorporating the conceptual framework of Datnow and Park (2018) within a recent qualitative study conducted in a high school within a large, urban school district in the southern United States, Hackman, Malin and Ahn (2019) identified the importance of collaboration and individual reflection to remove implicit biases, which often send hidden messages to students about their chances for success. The researchers recommended building a structured data use system that incorporates student equity as a lens for analysis, as well as, a system structured for continuous improvement. The researchers also highlighted the importance of leadership and structured time to support these capacities.

Research Questions

This research study examined teacher data use practices, their attitudes toward data, and the supports available to teachers. The data sources included in this study were representative of annual standardized assessment data, periodic assessment data, locally created assessment data, and personal teacher created assessment data (Wayman, Jeffrey, & Wilkerson, 2017). Specifically, this study investigated the data uses by teachers with Iowa Assessments (annual standardized assessments), interim benchmark assessments (periodic assessments), school developed assessments (locally created assessments), and classroom performance assessments (personal teacher created assessments). This study also investigated the perceptions of administrators and support staff regarding teacher data use.

1. To what extent do teachers use data to support instructional decisions?
2. To what extent do the following components impact teachers use of data to support instructional decisions?

      a.   Teacher competence in using data

      b.   Teacher Attitudes toward data

      c.   Teacher collaborative team trust

      d.   Organizational supports for teacher data use

3.   How do administrators and support staff view teachers use of data to support instructional decisions?

Definitions of Terms

Data Culture: A culture where teachers, administrators and instructional support staff work collaboratively and systematically towards a shared vision based on evidence. A data culture includes data driven knowledge construction, collaboration, systematic use of data to inform instructional decisions, trust between stakeholders and sustainability (Sun et al., 2016).

Data Driven Decision Making: The systematic collection, examination, analysis, interpretation, and application of data to inform instructional, administrative, policy and other decisions and practice (E. B. Mandinach & Jackson, 2012; Mertler, 2014; Schifter, 2014).

Data Literacy: The ability to understand and use data effectively to inform decisions. This includes transforming data into actionable knowledge (Begin, 2018; E. B. Mandinach & Jackson, 2012).

Data Teams: A group of individuals within a school tasked with collaborating to collect, analyze, and interpret data. Data teams reflect on data collectively and help to build data literacy in a school (E. B. Mandinach & Jackson, 2012).

Data Vision: A clear plan for school wide data use. This comprehensive plan establishes a data team, defines critical teaching and learning concepts, identifies activities, roles and responsibilities, and provides ongoing data leadership (Hamilton, 2009).

Sociocultural Theory: A theory that highlights the interaction of interpersonal, cultural-historical, and individual factors as the key to human development. Interactions with individuals in the environment stimulate developmental processes and foster cognitive growth (Schunk, 2016).

Student Centered Instructional Design and Practice: Systematic, tailored instruction for each student including informed curricular design and identifying best practices that meet each student at their most pressing instructional need (Danielson, 2007).

CHAPTER 2: Review of Related Research

The research presented in this review comes from peer-reviewed journals, national reports, educational policy, websites and research-based books. The findings from the literature have been organized into the following themes: 1.) historical development of data driven decision making in education; 2.) effective practices for data driven decision making; 3.) teacher attitudes toward data driven decision making; 4.) organizational support for data driven decision making; 5.) the role of school leadership regarding data driven decision making; 6.) student centered instructional design and practice; 7.) Teacher Data Use Survey (TDUS). 8.) effective professional development; 9.) principal leadership. This section concludes with a discussion regarding the gaps in research which this study addressed.

Historical Development of Data Driven Decision Making in Education

Early research on the use of data in education was conducted in the 1980's (Mandinach, et al., 2006). However, during the last twenty years, education has experienced a growing body of research to better understand the impacts that data can have on improving instructional outcomes. National education legislation reforms and advances in the development of information technology have merged to create a national culture of expectations regarding evidence-based decision making in education (Mandinach, et al., 2006).

Educators have been using assessment information to make decisions about instructional practices and intervention strategies forever (Mertler, 2014). Historically, the sources of assessment information were different and instructional decisions were

based on older tools of the professional educator including intuition, teaching philosophy and experience. While valid, these tools do not provide for the systematic process of data analysis required in today's classroom (Mertler, 2014). Today, teachers, principals, and other educational professionals must be able to analyze a wide array of standardized assessment data, periodic data, local data, and classroom data to advance instruction (Dougherty, 2015; Lewis, 2019; Mertler, 2014).

Over the last 30 years, specific advances have reshaped the educational landscape. Sophisticated methodological breakthroughs in psychometrics and educational statistics coupled with the impacts of advances in testing and marking with the aid of computers have created an explosion of information for educators (Matters, 2006). As policy makers and legislatures continue to legislate accountability measures, data driven decision making has become a prominent topic for many educators (Mertler, 2014). Recent history supports this claim.

In 2001, the federal government passed *No Child Left Behind,* which called for bi-partisan education solutions based on accountability, flexibility and choice. This reformation in educational law and funding addressed concerns regarding the progress of student learning and the inherent costs associated under the Elementary and Secondary Education Act of 1965. The NCLB Act sought to increase accountability by requiring state governments to implement state-wide accountability systems to measure learning (NCLB, 2001).

The Institute for Education Sciences (IES) was created in 2002 as a research branch of the Department of Education. The mission of the IES is to provide scientific evidence on which to ground education practice and policy so that information can be

shared with educators, parents, policy makers, and the public (IES, 2002). The IES was created by the Education Sciences Reform Act of 2002 (ESRA) to measure the effectiveness of federal and other education programs (ESRA, 2002).

Subsequent updates to national education policy continued to highlight the importance of data management in schools. In 2005, the Secretary of Education, Margaret Spellings believed that information was the key to accountability in education. Data is the best management tool to measure performance, identify successes and prescribe solutions to problems. Purposeful data analysis would help teachers and administrators evaluate learning more efficiently (Dougherty, 2015; Lewis, 2019; Mandinach & Jackson, 2012).

Data driven decision making was included as one of the four pillars of the American Recovery and Reinvestment Act of 2009 (Schifter, 2014). Secretary of Education Arnie Duncan, led a shift in the use of data from compliance toward principles of data for continuous improvement (Mandinach, 2016). This shift identified the power of data to inform decisions. Teachers were urged to use data in real time to create actionable change in the classroom.

In 2015, The Obama Administration enacted *Every Student Succeeds Act* (ESSA). ESSA included provisions of accountability and action to effect positive change in the lowest performing schools. ESSA sought to ensure that vital information is provided to educators, families, students, and communities through annual statewide assessments that measure students' progress toward those high standards (ESSA, 2015).

As the field of data analysis has grown in education during the last twenty years, so too has the impact of instructional technology. At the turn of the twenty-first century, it was not imaginable to have the depth and breadth of data exposure in the classroom with the expectation for teachers to use these new resources effectively. As such, research regarding data use in the classroom is considered young (Sun et al., 2016). Relatively few studies have attempted to quantify data use (Wayman, Shaw, & Cho, 2017). Additionally, research demonstrates that teachers are not incorporating data from the administration of standardized tests into their instructional decisions (Mertler, 2014). As such, additional research is required to better understand the dynamics surrounding teacher data use (Hamilton, 2009; Wayman, Johnson, & Wilkerson, 2017).

Effective Practices for Data Driven Decision Making

It is important to consider the spectrum of uses associated with data in the classroom. Data uses range from providing simple informational snapshots to teachers, parents and administrators to a high-level use to change instruction on an individual basis regularly. Effective data driven decision making is meant to move towards systematic tailored instruction for each student, to inform curriculum design, or identify and develop best practices, to motivate students and educators, to coach and supervise teachers and other school personnel, and to communicate information to outside audiences (Dougherty, 2015; Sun et al., 2016).

A synthesis of research conducted over a fourteen-year period by Sun, et al. (2016) highlights a spectrum of effective teacher practices in data driven decision making. These practices include the following actions: a.) connecting data to instruction; b.) using data to improve instruction; c.) data to plan and goal set; d.) data for assessing

and monitoring progress; e.) combining formative and summative assessment data with interventions based in research and implemented with fidelity.

Developing data analysis skills is complicated and takes time. Educators must avoid over-interpreting results when looking at assessment data. Making sweeping, important decisions regarding students or instruction must include reflection. "Failure to reflect on what you have done and to plan appropriately, adequately, and thoughtfully for future cycles will likely result in a lower degree of effectiveness in the long term," (Mertler, 2014).

Data literacy has been identified as an emerging realm of professional learning for both pre-service and current teachers. Data literacy is a foundational skill required from all education professionals today. Data literacy is the ability to transform information into actionable instructional knowledge and practices (Mandinach & Gummer, 2016). These skills may include the ability examine multiple data sets, synthesize information, and draw inferences. Not all teachers inherently possess these skills (Marsh & Farrell, 2015b).

Regarding the difference data driven decision making can make in student achievement, it should be noted that relatively few studies have attempted to quantify data use. One such quantitative study conducted by Wayman, Shaw and Cho (2017) sought to answer whether data makes a difference in student achievement. This two-year longitudinal study identified a significant relationship between data analysis and gains in elementary reading abilities, but no significant relationships were found between data analysis and elementary math or junior high reading. While the research results were poor according to the researcher, it was suggested that other critical factors must be accounted

for when examining teachers and data use. Wayman, Shaw and Cho (2017) identified

several themes which emerged from this study to better help us understand effective

practices. Accessing data is only the first step. Interpreting data and having the structured

time to reflect on the implications is also necessary. Teachers must understand

connections between data and future learning. Data system use by teachers is dependent

on the underlying messages communicated by leadership. Data system use is a skill set

itself which must be developed. Communities that incorporate collaborative feedback

loops will promote more effective data use.

Recent research suggests that developing data driven decision making skills and

data literacy in teacher education can be impactful (Dunlap & Piro, 2016). The

researchers explored how pre-service educators determined what worked in a data

literacy intervention and the impact this had on their instructional decision-making

process. The Data Chat tool created for the intervention was grounded in Constructivism

and formed by three primary principles from the Understanding by Design Framework

developed by Wiggins and McTighe (2005). Pre-service teachers used this eight-step

process as a guide to analyze data from state level standardized tests. The researchers in

this qualitative study identified important themes. After using the Data Chat, pre-

intervention beliefs, understanding and data analysis practices were noted to be

significantly improved by the participants. Most participants identified a limited

knowledge involving data for instruction at the classroom level and a genuine discomfort

for data practices prior to the intervention. Dunlap and Piro (2016) identified the

importance of being able to connect data to instruction as a component of data literacy,

and hence data driven decision making. Taking time to review statistical vocabulary will

assist in the professional learning of teachers. Finally, the researchers underscored the importance of self-efficacy when using data in educational contexts (Dunlap & Piro, 2016).

Teacher Attitudes Toward Data Driven Decision Making

If teachers' self-efficacy is positive regarding their ability to use data effectively in the classroom, they are more likely to be successful using data to improve instruction (Dunlap & Piro, 2016). However, research also indicates that leadership at the building level is critical toward developing positive data use practices and attitudes among teachers. A data savvy principal that models data use in everyday activities, will likely develop an appreciation with teachers for the need for data use and adopt the same philosophy (Mandinach, et al., 2006). Some teachers' reluctance to use data is grounded in a lack of training or mistrust of the data. Additionally, teachers can become overwhelmed with the sheer volume of information provided on standardized testing data (Mertler, 2014). Research identifies two branches of data training for success: a.) Training on the use and understanding of data; b.) Training on the specific data tools being used in a school (Mandinach, at al., 2006).

Trust is an essential factor in the development of a culture of data use (Matters, 2006). As accountability pressures increase at all levels of education, teachers often feel as though they must teach to the tests which are used to for instructional accountability. Some teachers' reluctance to use data tools is grounded in a mistrust of the actual data itself (Mandinach, et al., 2006). Through appropriate professional development, systematic planning, and leadership support, trust can be developed within the complex framework of expectations.

Organizational Support for Data Driven Decision Making

A data culture cannot be created in a school without organizational support for data driven decision making. A data culture is present when teachers, administrators and instructional support staff work collaboratively and systematically towards a shared vision based on evidence. A data culture includes data driven knowledge construction, collaboration, systematic use of data to inform instructional decisions, trust between stakeholders and sustainability (Sun et al., 2016).

A common theme throughout the research indicates a cyclical structure inherent within data driven decision making. This cycle is impacted by the ability of educators to access variable forms of student data and then know what to do with it once obtained. School leaders can support this process by incorporating data tools that offer an ease of access (Mandinach & Jackson, 2012). Additionally, school leaders can support teachers' process of data inquiry by employing knowledgeable consultants to assist (Sun et al., 2016).

Leadership, especially at the building level is the primary support needed to create a positive data culture (Begin, 2018; Mandinach & Jackson, 2012; Wayman, Jeffrey, & Cho, 2017). Through positive leadership, other organizational supports can be established. Providing structured regular time for teachers to analyze and apply data daily is arguably the most important organizational support (Wayman, Jeffrey, & Cho, 2017). Setting the stage for teachers to learn through professional development is another example of an organizational support established through leadership (Dunlap & Piro, 2016).

Providing ample structured time for professional development, including the

study of data driven decision making repeatedly is highlighted as a problem throughout

the literature (Mandinach & Jackson, 2012; Matters, 2006; Wei, et al., 2009). Wei, et al.

(2009) found that while 90% of public-school teachers across the nation participate in

professional development activities, the intensity and duration of most of these activities

are not sustained long enough for teachers to change their practice.

The Role of School Leadership Regarding Data Driven Decision Making

Data driven decision making begins with a unified vision created by senior

leadership. The more explicit the vision is, the more likely quality data practices will

succeed (Mandinach & Jackson, 2012). Leadership focuses on building human capacity

for data use. "Data driven decision making is a human resource that must be continuously

developed," (Mandinach & Jackson, 2012).

The research is resoundingly clear regarding the high impact of leadership,

specifically at the building level on developing the culture of data driven decision making

(Marsh & Farrell, 2015a; Piro, Dunlap, & Shutt, 2014; Piro & Hutchinson, 2014;

Popkewitz, 1998; Vaughn & Faieta, 2017). While superintendents set the tone for the

district's philosophy, principals have more direct contact with teachers and therefore

more influence on what teachers do with data (Mandinach, et al., 2006). Principals that

model the use of data in everyday activities foster a data culture with their teachers

(Hamilton, 2009; Mandinach, et al., 2006).

Sun, et al. (2016) identified three categories of leadership practices that promote

data use. Principals offer personal support by helping teachers find meaning in the data.

Principals provide technical support by creating protected, structured time and data systems to use data to inform instruction. Protected, structured time identified by principals to foster teacher collaboration has been identified as the difference maker when building a data wise culture (Dougherty, 2015; Sun et al., 2016). Finally, principals establish cultural support by working to foster a collaborative data-wise culture.

Student Centered Instructional Design and Practice

Planning for the productive activity of thirty or more students in a classroom presents a challenging task for any teacher (Danielson, 2007). A teacher is charged with considering the full range of individual personalities, learning styles, and learning needs across the group. A teacher must be able to connect with a diverse array of students and identify motivating activities so that all students will be engaged with their own learning. The best authentic use of data driven decision making may lead a teacher toward systematic, tailored instruction for each student, as well as, informing curricular design and identifying best practices that meet each student at their most pressing instructional need (Mandinach, et al., 2006).

A student-centered learning climate can have profound effects on student motivation and engagement. "The social psychology of a school is an integrative product of the beliefs, values, and actual everyday behaviors among school professionals, parents and students," (Byrk, 2010).

In general, relationships between teachers, students and their peers directly impact students' school participation and willingness to put forth high effort levels for classroom learning, (Byrk, 2010).

Differentiating instruction is a critical component of education. In this practice of differentiating instruction, teachers design and practice, "…different forms of instructional methods, materials, and assessments for each student based on their cognitive, affective, physical and cultural needs," (Mandinach & Jackson, 2012).

Using data to lead the process of differentiation is central to the teaching and learning process. Teachers must align the data with whole class needs. As these needs are identified, the teacher will continue their process of inquiry to identify small group needs based upon more narrowly defined learning criteria. Eventually, the teacher will break down the needs of the small group to identify additional individual learning needs (Danielson, 2007). Throughout this process of inquiry and analysis, teachers will design and implement lessons which have the capacity to impact learning across the spectrum of learners in the classroom (Mandinach & Jackson, 2012) "The combination of instruction aligned with formative assessments creates feedback loops that can be used to identify students' learning gaps, inform planning, and guide instruction," (Mandinach & Gummer, 2016).

Teacher Data Use Survey (TDUS)

The Teacher Data Use Survey (TDUS) can be used to gather information from teachers, administrators, and instructional support staff regarding teacher data use practices, teacher attitudes toward data, and the supports in place which help teachers participate effectively in a data cycle of inquiry. The TDUS was developed by the researchers to support the transformation of the Nashville Public School System to a data-informed culture. The survey has been based upon the latest research in school data use available. The survey seeks to help extend the research regarding data use in schools

to measure the actions, attitudes, and supports available for effective data use. The survey was developed for the Institute of Educational Sciences and is in the public domain for use, with the credit for use cited to the researchers (Wayman, et al., 2017; Wayman, Johnson & Wilkerson, 2017).

The survey is based upon a conceptual framework for how teachers use data. The survey examines the use of student data through annual assessments, periodic or interim assessments, local assessments, and teacher created classroom performance assessments. The conceptual framework includes a cycle of inquiry that is consist with the current body of research available today.

Effective Professional Development

"Efforts to improve student achievement can succeed only by building the capacity of teachers to improve their instructional practice and the capacity of school systems to advance teacher learning," (Wei, Darling-Hammond, Andre, Richardson, Orphanos, 2009).

High quality or effective professional development results in improvements of teachers' knowledge and instructional practice, as well as improved student learning (Darling-Hammond, LaPoint, Meyerson, Orr, & Cohen, 2007; Wei, et al., 2009). A current dilemma within the paradigm of data-driven decision making continues to be the measurable connection with better student outcomes (Wayman, Jeffrey, & Cho, 2017). The literature overwhelmingly supports the importance of sustained, content – focused professional development in order to change teacher practice in ways that support student learning (Darling-Hammond, et al., 2007; Wei, et al., 2009).

One study that analyzed the professional development features in high achieving countries identified the following themes. Teachers and school leaders had an extensive opportunity for both formal and informal collaboration. Organizational support for professional development built ample time for study and teacher collaboration. Professional development was embedded in teachers work-day and ongoing. School leadership and governance fully support professional development. New teachers were provided structured time to meet with mentors (Wei, et al., 2009). These findings validate the previously identified organizational supports required to establish data driven decision making.

Another researcher categorizes high quality professional development through content, context and design. Content must be centered on student learning and emphasize active teaching, assessment, observation, and reflection. Contextual relevance to teachers is critical. Professional learning must be integrated with school reform efforts, highlighting the need for collaborative and collegial learning environments. Finally, professional development should be designed to be active, sustained, involve modeling and allow the construction of knowledge (Darling-Hammond, et al., 2007).

Principal Leadership

"Researchers, policymakers, and practitioners increasingly recognize the role of school leaders in developing high performing schools," (Darling-Hammond, et. al., 2007).

New standards for learning along with higher expectations of schools means that principals must be able to do much more than merely administrative tasks. Successfully

teaching a broad array of students while improving achievement calls for principals to often redesign schools and the instructional process. This suggests that the skill set required to meet the demands of the modern school require a sophisticated understanding of instruction, organizational change and analysis (Darling-Hammond, et al., 2007).

Current literature supports Darling-Hammond's suggestion that the required skill set of modern-day principals is challenging. Michael Fullan identifies six interconnected qualities associated with deep leadership (Fullan, 2017). Tensions exist when leaders seek to strike a nuanced balance between important leadership themes. At the center of the paradigm, moral imperative and uplifting leadership substantiate school principals' commitment to their cause to improve learning at their school. Establishing a strong identity with a cause is essential to foster cohesiveness among all stakeholders. Other tensions exist as principals' master the balance between content and process for change, leading and yet still learning, acknowledging and developing students as change agents, providing transparent external support will improve the internal organization, and to perfect the art of being essential and dispensable over time (Fullan, 2017).

Summary

Research regarding the positive learning outcomes associated with data driven decision making is mixed. Researchers have not been able to cite causal evidence for the positive impacts of this cycle of inquiry. However, research also indicated that the variable nature of this process has inherent challenges associated with its quantification. Most of the research conducted on this topic over the last twenty years has been qualitative in nature. Current researchers are calling for more studies based upon quantitative methodology.

This research study seeks to add to the current body of work associated with TDUS tool and associated data use concepts. Additionally, this study is being conducted in a non-public school system. There is little current research regarding data driven decision making within the non-public school community.

CHAPTER 3: Method

Research Questions and Hypotheses

This quantitative research study examined the practices of teachers regarding their use of data driven instruction in an elementary system of schools in a suburban Roman Catholic Diocese in the Northeastern United States. Specifically, the study investigated teachers, administrators, and instructional support staff regarding teachers' use of data to support instruction, their attitudes toward data, and the supports that help teachers use data. The research questions developed for this study were feasible, clear, significant and ethical thus possessing required characteristics of quality research questions (Fraenkel, 2015). The research questions studied are identified below.

1. To what extent do teachers use data to support instructional decisions?

2. To what extent do the following components impact teachers use of data to support instructional decisions?

   a. Teacher competence in using data

   b. Teacher attitudes toward data

   c. Teacher collaborative team trust

   d. Organizational supports for teacher data use

3. How do administrators and support staff view teachers use of data to support instructional decisions?

The research hypotheses related to the research questions for this study supposed that a relationship would be found between teacher data use practices, teacher attitudes toward data use and systematic structural supports in place which foster data use to drive

instructional decisions. Additionally, this study hypothesized that a relationship will be identified between teacher data use practices and the perceptions of administrators and support staff. The research hypotheses for this study are identified below:

1. There is a positive correlation between teacher data use practices, teacher attitudes toward data use and structural supports for teachers to incorporate data use to drive instructional decisions.

2. There is a positive correlation between teacher data use practices, attitudes and support and administrator perceptions of teacher data use practices, attitudes and support for teachers to incorporate data use to drive instructional decisions.

3. There is a positive correlation between teacher data use practices, attitudes and support and instructional support staff perceptions of teacher data use practices, attitudes and support for teachers to incorporate data use to drive instructional decisions.

Research Design

This quantitative research study was designed to be a descriptive correlational study with the purpose of measuring variations in teacher data use, as well as, perceptions of teachers' data use by administrators and support staff. A cross sectional survey was used to gather information regarding teacher data use. Survey research involves collecting data to examine research questions regarding a specific topic such as data use. The cross sectional survey design was selected because it may be used to collect and analyze information at a single point in time, (Mills, 2016).

This research study used the Teacher Data Use Survey as a measurement instrument. The Teacher Data Use Survey (TDUS) was developed to, "…query teachers, administrators, and instructional support staff about how teachers use data to support instruction, their attitudes toward data, and the supports that help teachers use data", (Wayman et al., 2016). The TDUS tool was available on the public domain and permission to use was not required, (Wayman et al., 2016).

The research study occurred during the 2019 – 2020 school year at a suburban Roman Catholic Diocese in Northeastern United States near a major metropolitan area. The research was conducted in the midst of the Covid-19 pandemic. The system of schools included 39 elementary schools in two suburban counties. The schools' total student enrollment included 12,801students in Prekindergarten through the Eighth Grade. The schools were comprised of 28 single parish institutions and 11 interparish institutions known as regional schools. Demographic information showed that approximately 79% of students in this system were registered as white or Caucasian, 10% were African American, 5% were Asian, 6% were multi-racial, less than 1% were from other races. 16% of the students identified their ethnicity as Hispanic, while 84% identified as Non-Hispanic. 87% of the students identified as Catholic while 13% of students identified as Non-Catholic. Less than 1% of students received free or reduced lunch and breakfast. Less than 1% of students qualified for Title I services. All teachers, school administrators, and school instructional support staff were invited to participate through the survey emailed distribution. The 1,059 total education professionals included in this sample consisted of 99% lay people, while 1% belonged to a religious order. 97% percent of the education professionals identified as Catholic, while only 3% identified as Non-

Catholic. 96% of the educational professionals in this population were white, 3%

identified as multiracial, and one percent were other races. This demographic data was

supplied by the diocesan department of education from an annual report submitted to the

National Catholic Education Association (NCEA Summary, 2019).

Participants

A convenience sample of elementary school teachers, school administrators, and

instructional support staff was utilized for this study. A convenience sample is a group of

individuals that are available for study based upon proximity, or other nonrandomized

characteristics (Fraenkel, 2015; Mills, 2016). A convenience sample was chosen based on

the relationship of the researcher with the diocesan education department and the

available access of the potential respondents. The researcher was an administrator at one

of the elementary schools included in this study. The population of educational

professionals of the school system included 969 elementary school teachers

(Prekindergarten through Eighth Grade), 51 elementary school administrators including

principals and assistant principals, and 39 elementary school instructional support staff

(NCEA Summary, 2019). For correlational studies, a sample of at least fifty respondents

was deemed necessary to establish the existence of a relationship (Fraenkel, 2015; Mills,

2016). An ideal sample size in order to maximize confidence ranges for variability due to

sampling would be 500 respondents out of the total 1,059 education professionals being

surveyed. This figure is based on Fowler's Sample Size Table and represents an error

tolerance of four percent with a 95% confidence interval (Fowler, 2009).

Instructional support staff were defined as staff members that support the

classroom instructional process through academic intervention services. For this study,

instructional support staff were considered employees of the school and worked in a capacity that directly supported student learning through Response to Intervention processes or other academic intervention services. Instructional support staff in this study did not include teacher aides or special education teachers specifically employed and provided by the local educational association public school district.

A letter requesting permission to conduct this study along with this research proposal was sent to the superintendent of schools. Once formal written consent was received from the superintendent of schools, an electronic survey was emailed to participants in each category to complete the survey. An existing data base of school administrators, elementary teachers and instructional support staff was maintained by the diocesan administrative team and was used to send the survey invitation to each group of participants. Unique letters of request for participation were sent to all participants from each group, including the school administrators, elementary teachers, and instructional support staff. The letters of consent included information that participation was voluntary and that they may terminate their participation at any point during the study without penalty. Survey responses were collected during a fourteen-day period. The desired sample consisted of all elementary teachers, school administrators, and instructional support staff from all thirty-nine schools.

Instrument

The TDUS (Wayman et al., 2016) was developed for use in the public domain and was available from the Institute of Education Sciences and U.S. Department of Education. The TDUS included an administration guide to assist researchers in localizing the tool to best meet their research needs. The TDUS instrument utilized nine separate

scales or groups of question items that measured each of the five conceptual components, including (a.) Actions, (b.) Competence in Using Data, (c.) Attitudes Toward Data, (d.) Collaboration, (e.) Organizational Support. The scales were alike in all three versions of the survey. The questions on the survey were set on a four-point Likert scale. The responses for each question were assigned numeric values from one to four to support statistical computations (Fowler, 2009).

The TDUS survey tool was validated and survey items found to be reliable (Wayman, et al., 2017). The survey was piloted in a large, urban district in the Southern United States consisting of over 80,000 students. The study team drew a random sample of 150 teachers, sixty school administrators, and twenty-five instructional support staff. The participant responses included forty-seven teachers (31 percent), nineteen administrators (32 percent) and seventeen instructional support staff (68 percent). Descriptive statistics including means and standard error of means were computed for each scale, separated by each role. Standard errors were typically between 0.10 and 0.20, indicating that a high response variability did not need to be considered. Reliability analyses were computed using Cronbach's alpha. Cronbach alpha reliability coefficient measures the internal consistency for an instrument requiring only one test administration (Fraenkel, 2015). The Cronbach alpha statistics for each scale ranged between 0.84 (Actions with common formative assessment data) to 0.97 (collaborative team actions). Most Cronbach alpha statistics were above 0.90 indicating a strong scale reliability. Descriptive analysis was used to identify commonalities and oddities between the individual survey items and between the three survey forms for the teachers,

administrators, and instructional support staff. Item discrimination analyses were conducted by computing correlations between scale means (Wayman, et al., 2017).

As described in the user guide, the researcher customized the survey to identify specific data sources used in this school system and add specific demographic information to enhance analysis (Wayman et al., 2016). The demographic information on the survey was formatted to minimize the likelihood of participant identification and maintain anonymity for all respondents. Demographic data being sought included the experience level of the participant and the school enrollment size. The survey began with questions which collected descriptive information regarding the availability and use of student assessment data. The data sources being investigated on the survey include the following items: (a.) Iowa Assessment Data, (b.) Interim (Benchmark) Data, (c.) School Developed Assessment Data, (d.) Classroom Performance Data, (e.) other data.

The survey contained five components which were measured through a total of nine scales or clusters of questions. Each component was measured by one or more scales. The components included actions with data for each data form, competence in using data, attitudes toward data, collaboration, and organizational supports.

The actions with data component was measured by two scales. The first scale, actions with data, consisted of four questions of eight items each, phrased differently for each group of respondents. Each question referred to one of the four sources of data being investigated. The second scale, collaborative team actions sought to recognize the importance of the inquiry cycle for data-based practices. This scale consisted of one question of ten items, phrased differently for each group of respondents.

The second component, competence in using data, is measured by one scale. The data competence scale measured how good teachers were at using data to inform different components of their practice. This scale consisted of one question of four items, phrased differently for each group of respondents.

The third component investigated was identified as attitude towards using data. This component was measured by two separate scales. The first scale, data's effectiveness for pedagogy, inquired how valuable data was for everyday pedagogy. The scale consisted of one question of five items, phrased differently for each group of respondents. The second scale, attitudes toward data sought to understand individual attitudes and opinions regarding data use. This scale consisted of one question of four items and was phrased the same for all respondents.

The fourth component being investigated was identified on the survey as collaboration. This component was measured by one scale. The collaborative team trust scale identified levels of trust between teachers, administrators and support staff. This scale consisted of one question with five items, phrased alike for all respondents.

The fifth component included in this survey was organizational support. This component was measured by three separate scales. The first scale, support for data use, asked about support available for teachers using data to inform their instructional decisions. The scale consisted of one question of six items, phrased differently for each group of respondents. The second scale, principal leadership, measured how the principal and assistant principal led teachers in using data. The scale consisted of one question of six items, phrased differently for administrators and non-administrators. The third scale, computer data systems, asked about technology for accessing and examining data. The

scale consisted of one question of five items, phrased the same for all respondents. In total, the survey was expected to take between fifteen and twenty minutes for participants to complete.

Procedures

The researcher customized the TDUS instrument for use in the system of schools based on the known data sources available to teachers. This customization followed the recommendations identified in the administrative guide created by the developers of the instrument (Wayman et al., 2016). Additional demographic information was included in the survey to identify ranges of experience of respondents, as well as ranges of school size of respondents. Ranges were used in order to mitigate the risk of identifying participants (Mills, 2016). Once the TDUS instrument was customized, an electronic version was created for each group of respondents, including teachers, administrators, and instructional support staff through Survey Monkey, a web-based survey platform. The survey instrument was emailed to participants in each group which included a letter of consent and information regarding voluntary participation. The letters of consent were based on the sample letters established in the guide to implement the survey. Within the email to participants, an electronic link allowed respondents direct access to complete and submit the survey anonymously. Data collection began in June 2020 and ceased in September 2020.

Analysis

The survey was administered through Survey Monkey, a web-based survey administration tool. Results from each of the survey versions were downloaded to create

useable Excel data files for analysis. Statistical analysis was conducted using SPSS, a data analysis tool. Prior to the analysis, the Excel data files were expanded and reviewed for possible file corruptions or other concerns. To analyze the data in SPSS, the Likert scale data was changed to numeric values based on the number of responses on individual questions. Careful review of each item was taken to ensure that the numeric values used were adjusted depending on the positive or negative language used in the specific question. Each Excel data file was uploaded into SPSS for analysis. Missing data was identified and replaced using the missing data function in SPSS. Reliability measures were conducted for individual questions or scales. Descriptive statistics were conducted with the demographic results for all three survey versions. Additional descriptive statistics (means and standard error of means) were computed by each scale. Descriptive statistics allowed the researcher to meaningfully describe the data with numerical indices or in graphic form. The standard error of means were used to indicate how much variation can be expected if other samples from this population were collected (Fraenkel, 2015). Item discrimination analyses were conducted by computing item total correlations for survey questions within the scales, separated by role. Discrimination analysis is an accepted statistical procedure for predicting group membership from two or more quantitative variables (Fraenkel, 2015). Scale means were computed for all scales to conduct correlational analysis. Bivariate correlations were conducted using the scale means. Correlational calculations from the collected data enabled the researcher to determine the degree to which relationships existed between two or more variables (Fraenkel, 2015).

Limitations

This research study is limited regarding the generalizability of the findings beyond the population of the study. Non-randomized, convenience sampling limits how the findings of this study may be applied (Fraenkel, 2015). Additionally, the study was designed to take a one-time snapshot of responses from the population. This cross-sectional survey design did not allow for deeper exploration with teachers, administrators and instructional support staff beyond their inherent survey responses. Finally, the researcher conducting the survey was a potential respondent as an administrator at one of the diocesan elementary schools. Every effort was made to limit the potential for researcher bias throughout this study by sharing results and analysis with the administrative team. This sharing of results and analysis helped to prevent researcher bias.

CHAPTER 4: Results

Introduction

  This quantitative research study examined the practices of teachers regarding their use of data driven instruction in an elementary system of schools in a suburban Roman Catholic diocese in the northeastern United States. The Teacher Data Use Survey (TDUS) was administered to teachers, administrators, and instructional support staff to capture information regarding teachers use of data to support instruction, their attitudes towards data, and the supports that help teachers use data. Similar versions of the TDUS were administered to administrators and instructional support staff to quantify these two subgroups perceptions regarding teacher use of data to support instruction, teacher attitudes toward data, and the supports that help teachers use data.

  The survey categorized five components which examined data use: a.) actions teachers take with data, b.) teachers' competence in using data, c.) teachers' attitudes toward data, d.) teachers' collaboration with data, and e.) the organizational supports available to teachers. The five components were measured by nine separate scales or related clusters of questions. Respondent demographic information was included at the beginning of the survey.

  The Teacher Data Use Survey was distributed electronically through a system email server to each of the three subgroups which included teachers, administrators, and instructional support staff. From the 969 elementary teachers that received the Teacher Data Use Survey for Teachers, a total of 158 responses were received for a response rate of 16.3 %. The administrators' version of the survey was distributed to 51 elementary school principals and assistant principals. The TDUS for Administrators yielded a total of

20 responses for a response rate of 39%. The instructional support staff version of the survey was distributed to 39 elementary school instructional support staff. The TDUS for Instructional Support Staff yielded four responses for a response rate of 10%.

It is important to state that the survey was administered during the Covid-19 pandemic. The researcher received direct email responses from three potential respondents which indicated that their willingness to participate in the survey was affected by their experiences during the Covid-19 pandemic. The geographic area which the study was conducted experienced significant impacts as a result of the pandemic.

The resulting data from each survey version from teachers, administrators, and instructional support staff was reviewed for accuracy and consistency. Likert-type responses included in the survey were given numerical values ranging from one to four or one to five based on the specific question. This allowed the researcher to conduct the ensuing statistical analysis through SPSS. Each data set was screened for missing values utilizing SPSS. Missing values were replaced in SPSS using the Replace Missing Values function.

The results from each survey version have provided an opportunity to better understand the complexities associated with teacher data use. The survey gathered selected demographic information to enrich the study findings. The tables below describe specific demographic characteristics from respondents including years of experience, the education level, the classroom and school enrollment size of the respondents.

Demographic Results

Experience as an educator, for each subgroup, was identified through the survey. The TDUS Teacher version results indicated that 31% of teacher respondents possessed over 20 years' experience, while 23% responded that they possessed between 15- and 19-years' experience and 16% revealed that they possessed 10 and 14 years of experience. The TDUS Administrator version reported that 35% of administrators had four years of experience or less, and 25% held between 5- and 9-years' experience as administrators. Results from the TDUS Instructional Support Staff version showed that 50% of instructional support staff had between 5- and 9-years' experience, while another 25% reported that they had between 10- and 14-years' experience. Table 1 describes the range of experience by respondent subgroup for all three versions of the TDUS administered.

Table 1

Range of Experience by Respondent Subgroup

Experience (years)	Percentage of TDUS for Teachers Respondents	Percentage of TDUS for Administrators Respondents	Percentage of TDUS for Instructional Support Staff Respondents
0 - 4 years	16.46%	35%	0%
5 - 9 years	12.03%	25%	50%
10 - 14 years	16.46%	10%	25%
15 - 20 years	23.42%	10%	0%
20 or more years	31.65%	20%	25%

The education level of respondents by subgroup of teachers, administrators and instructional support staff was reported through the survey. The majority of respondents in each subgroup have completed a Master's Degree as the highest level of education. By

subgroup, the results of the survey revealed that 89% of teachers, 90 % of administrators, and 75% of instructional support staff have earned a Master's degree. The survey results describing education level by subgroup is included in Table 2 below.

Identifying class size from teacher respondents provided an additional lens to consider data use practices in the classroom. The teacher survey results revealed that respondents to this survey taught in primarily two distinct class sizes. 40% of teacher respondents reported that they taught in a class of 11 to 19 students, and 50% taught in a class of between 20 – 29 students. The survey results indicating class sizes by teacher respondents is included below in Table 3.

Table 2

Education Level by Respondent Subgroup

Education (Highest degree earned)	Percentage of TDUS for Teachers Respondents	Percentage of TDUS for Administrators Respondents	Percentage of TDUS for Instructional Support Staff Respondents
Bachelor's Degree	11%	0%	25%
Master's Degree	89%	90%	75%
EdD or PhD	0%	10%	0%

Table 3

Teacher subgroup class size

Class Size	10 or fewer students	11 – 19 students	20 – 29 students	30 or more students
Percentage of Teacher Respondents	7%	40%	50%	3%

School enrollment figures were included to provide more information about the range of school sizes. This demographic item was included in the TDUS Administrator version and the TDUS Instructional Support Staff version only. The total school enrollment results indicated that 45% of administrators and 75% of instructional support staff are working in schools with an enrollment between 151 and 300 students. The survey results indicating school enrollment sizes from administrator and instructional support staff is reported below in Table 4.

Table 4

School Enrollment Size by Subgroup

School Enrollment Size	150 or fewer students	151 – 300 students	301 – 450 students	451 students or greater
Percentage of Administrator Responses	10%	45%	25%	20%
Percentage of Instructional Support Staff	0%	75%	0%	25%

Results for Research Question 1

To what extent do teachers use data to support instructional decisions?

Hypothesis 1: There is a positive correlation between teacher data use practices, teacher attitudes toward data use and structural supports for teachers to incorporate data use to drive instructional decisions.

Identifying Available Assessment Data Sources

The Teacher Data Use Survey (TDUS) identified specific assessment data sources which may be used by teachers in their instructional practice. The assessment data sources and assessment data types are described in Table 5 and included the following list

of assessment data sources: a.) Iowa Assessments, b.) Interim (Benchmark) Assessments, c.) School developed assessments, d.) Classroom performance assessments. The TDUS Teachers version identified that the Iowa Assessments were the most readily available assessment type. In fact, 62% of teachers identified that Iowa Assessment data was available to them. Conversely, interim (benchmark) assessment data, school developed assessment data were both described as available by less than 5% of teacher respondents. Almost 11% of the teacher respondents stated that none of the assessment data sources were available to them. Aside from the Iowa Assessments, the only other assessment data source identified as readily available to teachers was classroom performance assessment data. The survey results revealed that 16% of teacher respondents have classroom performance assessment data available. Table 6 below describes which data sources were identified by the respondents as available for teachers to use in their instructional practice. The results from this survey question may help shine a light on the wide misunderstanding regarding assessment data types and their usefulness.

Table 5

Assessment Data Sources by Category

Categories of Assessment Data	Types of Assessment Data in the TDUS
Annual Standardized Assessments	Iowa Assessment
Periodic Standardized Assessment	Interim (Benchmark) Assessment
Periodic Local Assessment	School Developed Assessment
Classroom Local Assessment	Classroom Performance Assessment

Table 6

Assessment Data Forms Available by TDUS Subgroup

Assessment Data Source	Teacher	Administrator	Instructional Support Staff
Iowa Assessment Data	65.25%	100%	67%
Interim (Benchmark) Assessment Data	4.96%	0%	33%
School Developed Assessment Data	2.84%	0%	0%
Classroom Performance Data	15.60%	0%	0%
Other	0.71%	0%	0%
None of the above	10.64%	0%	0%

Frequency of Assessment Data Use by Source

It is known that teachers use many kinds of data to help plan for the instructional needs of students. Measuring the frequency of use of each data source described in the TDUS to help plan for the instructional needs of students provides a broad overview to consider. The results from the TDUS Teacher version revealed that a significant percentage of teachers do not use each assessment data source equally to help plan for instruction. For example, 37% of the teachers responded they do not use data from the Iowa Assessments, 45% do not use interim (benchmark) assessment data, and 43% do not use school developed assessment data in any capacity.

Teachers responded that classroom performance data was the most frequently used data source used to plan for the instructional needs of students. Survey results revealed that classroom performance data was used by 34% of teachers weekly or almost weekly and 34% percent used this data source at least a few times a week. As such, 68%

percent of the teacher respondents reported using data from the classroom performance assessments weekly or more to plan for instruction that meets student learning needs.

Table 7 shows the percentage of teacher respondents that use specific data sources less than once a month or not at all. While the Iowa Assessments were previously identified as the being the most available to teachers, the survey results demonstrated that the Iowa Assessments are also the least frequently used to help plan for instruction. 83% of teacher respondents indicated that Iowa assessment data results were used less than once per month or not all.

Table 7

Frequency of Assessment Data Sources Used by Teachers to Plan for Instruction

Data Source	Percentage of Teachers' Use Less Than Once a Month or Not at All
Iowa Assessments	83%
Interim Benchmark Assessments	66%
School developed assessments	55%
Classroom performance assessments	17%
Other assessments	52%

To further describe the results from this survey question which identified the frequency of use of each assessment data form, weighted means were calculated using SPSS. For analysis, a numeric value was substituted from each response ranging from a low of one to a high of five based on the Likert scale responses from the TDUS Teacher

version. The range of responses included *Do Not Use, Less than once a month*, *Once or twice a month*, *Weekly or almost weekly*, *A few times a week*. Weighted means from the TDUS Teacher version provided an additional indicator to substantiate the frequency of use by assessment data source which teachers use to help plan for instruction. Results indicated that classroom performance assessments were the most frequently used (WM = 3.72). The weighted means of the other identified data sources included school developed assessment data (WM = 2.31), interim (benchmark) assessments data (WM = 2.03) and Iowa Assessment data (WM = 1.84). Even though teacher respondents identified that Iowa Assessment data was the most available, this data source was the least frequently used to help teachers plan for instruction. This is a critical finding and has been discussed in Chapter 5 in more depth. Table 8 describes the frequency of use by teacher respondents for each data source using weighted means.

Table 8

Frequency of Use of Assessment Data Source by Teachers (Weighted mean)

Assessment Data Source	Frequency of Use (Weighted mean)
Iowa Assessment Data	1.84
Interim (Benchmark) Assessment Data	2.03
School Developed Assessment Data	2.31
Classroom Performance Assessment Data	3.72
Other Assessment Data	2.48

It is worth noting that 58 teacher respondents to this question stated that they use "other" assessment data sources to help plan for the instruction that meets student learning needs. The weighted mean of this selection by teacher respondents was 2.48, which was actually the second highest weighted mean from all possible assessment data sources. Respondents were provided an opportunity to identify other assessment data

sources in the survey. Of the 15 teachers which took this extra step to include other

assessment data sources, the responses included the following list: NYS Art Standards,

teachers own assessment sources, Art projects, online assessment tools such as Ed

Puzzle, and NYS Testing data. Eight of the 15 respondents included a form of classroom

performance assessments in the "other" category. Other researchers have identified the

prevalence of teacher misunderstanding surrounding assessment data. This is but one

example to substantiate that claim.

Attitudes Toward Data

The TDUS Teacher version asked teachers to identify how useful each form of

assessment data is to their respective practice. The survey provided a four-point Likert

scale to identify a range of usefulness from *Not useful* to *Very useful.* Using weighted

means, the results showed that teachers found classroom performance assessment data

was the most useful (WM = 3.36), followed by school developed assessment data (WM =

2.41), other assessment data (WM = 2.33), interim periodic (benchmark) assessment data

(WM = 2.21) and Iowa Assessment data (WM = 1.98). It must be noted that the *other*

assessment data identified by respondents were actually specific types of classroom

performance assessment data.

Actions with Data

The TDUS Teacher version, through a series of four questions further delineated

teacher practices with each assessment data form. Each question highlighted a data form

(i.e. Iowa Assessments, Interim (benchmark) Assessments, School developed

assessments, and Classroom performance assessments) by asking teachers how frequently

during a month do they complete specific data practices. Results from the TDUS Teacher version have been described for each assessment form in a separate section below. The data use practices being investigated in these questions included the following actions: a.) To identify instructional content to use in class; b.) To tailor instruction to individual students' needs; c.) To develop recommendations for additional support; d.) To form small groups of students for targeted instruction; e.) To discuss data with a parent or guardian; f.) To discuss data with a student; g.) Meet with a specialist about the data; h.) Meet with another teacher about the data. The four-point Likert scale of frequency rates were described as *Less than once a month*, *Once a month*, *Weekly or almost weekly*, and *A few times a week*. Weighted means were calculated by substituting numeric values from one (i.e. Less than once a month) to four (i.e. A few times a week). The results from the teacher respondents regarding each data type are described in the following sections.

Iowa Assessment Data Use

As previously stated, Iowa Assessment data was identified as the least useful to teachers. When considering the frequency of specific instructional practices which teachers utilized Iowa Assessment data, results substantiated that teachers found this assessment form the least useful. For example, the TDUS Teacher version showed that 90% of the teacher respondents use Iowa Assessment data to identify instructional content to use in class at most a few times a year. 89% of the teacher respondents use Iowa Assessment data to tailor instruction to individual students' needs at most a few times a year. 86% of the teacher respondents use Iowa Assessment data to develop recommendations for instructional support at most a few times a year. 86% reported using Iowa Assessment data to form small groups of students for targeted instruction at

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most a few times a year. Almost all teachers (98%) reported using Iowa Assessment data with a parent or guardian at most once or twice a year. 96% of teachers reported using this data with a student a few times a year or less. 94% reported using Iowa Assessment data to meet with a specialist at most a few times a year. 93% reported that they met with another teacher to discuss Iowa data at most a few times a year. Table 4.9 uses weighted means to compares the frequency of data use practices by assessment form by teachers.

Interim Assessment Data Use

Previously, it was noted that teachers identified Interim (Benchmark) Assessment data as the second most useful data form after classroom performance assessment data. When responding to this question regarding their specific data use practices with Interim (Benchmark) Assessment data, 58% of the teacher respondents chose to skip this question. The survey allowed for teachers to skip assessment data forms that they did not use. Of the teacher respondents that answered, most demonstrated a limited usage of this data source. For example, the most frequently incorporated data action, to use interim benchmark assessment data to form small groups of students for targeted instruction, was identified by only 6% of teacher respondents as used a few times a week.

Calculated weighted means can further describe the frequency of instructional practices by teacher respondents. The least frequent action identified by teachers included, to use interim assessment data to make recommendations for additional support (WM = 1.54), to discuss interim benchmark assessment data with a parent or guardian (WM =1.59), to meet with another teacher about interim benchmark assessment data (WM = 1.64) and to discuss interim benchmark assessment data with a student (WM = 1.82). The weighted means for frequency of use for this assessment data form range

between 2.02 and 1.54. This means that for all of the specific data practices identified, teachers only work with this data type about one time per month.

School Developed Assessment Data

A total of 58 of the 159 teacher respondents completed the survey component regarding frequency of data use practices based on school developed assessment data. Again, a low percentage of survey respondents identified using school developed assessment data a few times a week for any of the identified data practices. Tailoring instruction to individual student's needs was the most frequently used action item by respondents (WM = 2.18). The least frequently used action item, to discuss data with a parent or guardian, had a weighted mean of 1.61. This range of weighted means indicated that the limited number of teacher respondents that identified using school developed assessment data to support specific instructional practices were typically used once or twice a month.

Classroom Performance Assessment Data

The TDUS Teacher version revealed that the instructional practices associated with classroom performance assessment data displayed specific material differences compared to the prior three assessment data forms. To begin with, 98 teachers responded to this question. This is an increase of 40 responses over the other data forms. Teachers thus indicated that they use classroom performance assessment differently, most notably including frequency, then other data forms. Four of the eight data use practices were used by over 20% of the respondents a few times a week. Teachers responded that they use classroom performance data most frequently in the following ways: a.) To identify

instructional content to use in class; b.) During small group instruction for targeted needs;

c.) To tailor instruction to individual students' needs; d.) To develop recommendations

for additional instructional support. Teachers identified meeting with a specialist about

classroom performance data as the least frequent practice (WM = 1.98). Considering the

weighted means associated with this data type, the range falls between 2.94 and 1.98.

This substantiates the finding that teachers utilized classroom performance assessment

data weekly or even a few times a week for all of the identified instructional practices.

Table 4.9 below describes the weighted means of the frequency of use of each

instructional practice of teachers by the different assessment forms.

Table 9

Frequency of Teacher Data Use Practices by Assessment Form (Weighted means)

Data Use Practice	Iowa Assessment Data	Interim (Benchmark) Data	School Developed Assessment Data	Classroom Performance Data
To identify instructional content to use in class.	1.4	1.82	2.14	2.94
To tailor instruction to individual students' needs.	1.53	1.95	2.18	2.9
To develop recommendations for additional support.	1.54	1.85	2.11	2.63
To form small groups of students for targeted instruction.	1.51	2.02	2.04	2.79
To discuss data with a parent or guardian.	1.19	1.54	1.61	2.03
To discuss data with a student.	1.13	1.58	1.89	2.41
Meet with a specialist about the data.	1.27	1.61	1.74	1.98
Meet with another teacher about the data.	1.37	1.72	1.96	2.33

Note: All figures are shown as weighted means of teacher respondents regarding the action's frequency of use. The weighted means reports the frequency of each data use practice on a monthly basis ranging from less than one time a month (numeric value =1) to a few times a week (numeric value = 4).

Frequency of Collaborative Team Actions

The Collaborative team actions scale inquired about actions that school data teams make with data. Responses were provided to a Likert scale which ranged from strongly disagree to strongly agree to a series of statements used to measure this scale. A total of 88 teacher respondents completed this question. While the majority of respondents indicated more agreement than disagreement that these collaborative team actions happen, the results did not demonstrate a strong agreement by any means. The least frequent collaborative team action may be the most telling. Only 62% of teachers identified that their teams approach an issue by looking at data. The most frequent collaborative team action, identified by 82% of the teachers, indicated that their data teams discuss their preconceived beliefs about an issue.

Weighted means were computed using SPSS. Numeric values were substituted for each Likert scale response ranging from a one for strongly disagree to a four for strongly agree. The collaborative team actions scale weighted means ranged from 2.63 to a high of 2.87. This numeric value suggests that the survey respondents may be closer to agreement that these actions do occur, but there is certainly not full agreement. This may indicate variations of collaboration regarding data use throughout individual schools.

Further analysis of these results revealed that teachers identified more frequent collaborative team actions that would typically happen as a result of the collaborative process but which may not have originated with an attempt to understand baseline data. For example, teachers indicated the weakest collaborative team action as approaching an issue by looking at data, (WM = 2.63). However, collaborative team actions that had much higher percentages of frequency by respondents would typically happen further

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down the data analysis road. Actions such as drawing conclusions based on data, (WM = 2.89), predicting possible student outcomes based on data, (WM = 2.85) and identifying actionable solutions based on conclusions, (WM = 2.86) were identified with much higher rates of frequency. While these collaborative team actions may occur, one has to question their efficacy if they are not grounded fully in the presumptive statement that teams approach issues by looking at data as a point of initiation. Table 10 describes each collaborative team action and the strength of agreement by teachers as identified by weighted means.

Table 10

Collaborative Team Actions by Teachers

Collaborative team actions	Teacher Agreement (Weighted means)
We approach an issue by looking at data.	2.63
We discuss our preconceived beliefs about an issue.	2.87
We identify questions that we will seek to answer using data.	2.68
We explore data by looking for patterns and trends.	2.78
We draw conclusions based on data.	2.89
We identify additional data to offer a clearer picture of the issue.	2.73
We use data to make links between instruction and student outcomes.	2.83
When we consider changes in practice, we predict possible student outcomes.	2.85
We revisit predictions made in previous meetings.	2.73
We identify actionable solutions based on our conclusions.	2.86

Hypothesis 1: There is a positive correlation between teacher data use practices, teacher attitudes toward data use and structural supports for teachers to incorporate data use to drive instructional decisions.

To identify whether a relationship between entire scales existed, the mean value for each item within a scale was computed in SPSS through the Transform Data function. This function created a Mean value for the entire scale. This mean value was used to identify the existence of a relationship between specific scales related to teacher data use practices, teacher attitudes toward data use, and structural supports for teachers to incorporate data use.

The SPSS results from a bivariate comparison indicated a positive relationship between teacher data use practices, teacher attitudes toward data use, and the structural supports for teachers to incorporate data use to drive instructional decisions. Additionally, significant results were identified between a number of these scales. The Usefulness of Data scale had a significant positive correlation across all four Actions with Data sources. The highest correlation existed between the Usefulness of Data Scale and Actions with Data – Classroom Assessments, $r(158) = .358$, $p < .05$. Significant results were found between Collaborative Team Actions scale and Actions with Data – Classroom Assessments, $r(158) = .256$, $p < .05$. It was also noted that the strongest relationship identified from the Principal Leadership scale was between the Actions with Data – Iowa Assessment scale, $r(158) = .241$, $p < .05$.

The hypothesis indicating that a positive correlation exists between teacher data use practices, teacher attitudes toward data use and structural supports for teachers to incorporate data use to drive instructional decisions must be accepted based on the results described herein. It should also be noted that while a positive statistical relationship exists, the results can only be described as a moderate relationship based on the strength of the correlations indicated. Table 11 describes the results of the bivariate correlation analysis in more depth.

Table 11

Bivariate Correlation of Scale Weighted Means

TDUS Scales	Actions with Data - Iowa Assessments	Actions with Data – Interim Assessments	Actions with Data – School Assessments	Actions with Data – Classroom Assessments
Usefulness of Data	.287*	.264*	.311*	.358*
Collaborative Team Actions	.196*	.102	.140	.256*
Principal Leadership	.241*	.058	.073	.174*
Computer Data Systems	.185*	.095	.217*	.163*

Note: * Correlation is significant at the .05 level (2-tailed).

Results for Research Question 2

To what extent do the following components impact teachers use of data to support instructional decisions?

    a. Teacher competence in using data

b. Teacher attitudes toward data

c. Teacher collaborative team trust

d. Organizational supports for teacher data use

The TDUS Teacher version investigated specific scales associated with teacher data use. The components included the following items: a.) teacher attitudes toward data; b.) teacher competence in using data; c.) teacher collaborative team trust; d.) organizational supports for teacher data use.

A reliability analysis was conducted to ensure that the questions in each scale measure consistently what was intended. This analysis was conducted using SPSS. The results of this survey administration found the scales were highly reliable. Cronbach alpha statistics for each scale were 0.94 or higher. A Cronbach alpha over 0.80 is typically considered reliable.

Teacher Attitudes Toward Data

Understanding the perceived usefulness of assessment data sources provided insight regarding each assessment data source's frequency of use. This survey question provided Likert scale responses regarding the usefulness of data sources which ranged from not useful to very useful. As previously described, respondents indicated that classroom performance assessment data was used the most frequently. Teacher respondents also indicated that classroom performance data was the most useful to their practice.

The Likert scale responses were transformed into numeric values for statistical analysis, ranging from a value of one for a response of not useful to a value of four for

very useful. Weighted means were calculated in SPSS. The highest weighted mean from

teacher responses regarding the usefulness of classroom performance assessment data

was 3.36. The lowest weighted mean identified listed the Iowa Assessment Data as the

least useful to teacher practice was 1.98. Weighted means of responses for teachers are

displayed in Table 12 below.

Table 12

Usefulness of Data Forms to Teacher Practice (Weighted means)

Assessment Data Forms	Teacher
Iowa Assessment Data	1.98
Interim (Benchmark) Assessment Data	2.21
School Developed Assessment Data	2.41
Classroom Performance Assessment Data	3.36
Other	2.33

Note: Values reported represent weighted means of teacher responses from the Likert
scale. This scale ranged from a numeric value of one for responses indicating not useful
to a numeric value of 4 for responses indicating very useful.

The survey provided an option for respondents to identify other forms of data

used in their instructional practice. Twelve of the teacher respondents included other data

forms they use in their instructional practice. These responses included the following

running list including, classroom observations, exit tickets, Dibbles and running records,

art work, no testing in Kindergarten, I am a Spanish teacher, my school does not

benchmark, Esgi software. It is important to note that each of these other data forms

identified actually This range in additional responses may be related to a greater lack of

understanding or use of a systematic method for using data to inform instructional

practices. fall under the Classroom Performance Assessment data category.

Teacher Competence in Using Data

Understanding perceptions regarding teacher competence in using data is important. Teachers responded to a set of statements designed to measure their attitudes toward data use practices. These four statements included using data to diagnose student learning needs, adjust instruction, lesson planning, and setting student goals. The survey provided a four-point Likert scale question with responses which ranged from strongly disagree to strongly agree. When asked about their attitudes toward their own use of data, teachers tended to respond positively. The weighted means from this scale ranged from 2.83 to 2.90. The teachers responded that they were best at adjusting instruction based on data. This perceived competence identified by teacher respondents had the highest weighted mean (WM = 2.90). Perceived teachers' competence regarding using data to plan lessons had the lowest weighted mean (WM = 2.83). A weighted mean of three would suggest that teacher respondents perceived agreement in their competence to complete these data actions. The actual weighted means were all slightly below three and will be discussed in chapter 5. Table 13 demonstrates the percentage of teachers that agreed or strongly agreed with each data use competence statement. Corresponding statement weighted means have been provided, as well.

Understanding teacher attitudes regarding the effectiveness of data for pedagogy is another important component identified in the research. The TDUS Teacher version provided a four-point Likert scale for teachers to respond to a series of statements. These responses ranged from strong disagreement to strong agreement.

Table 13

Teacher Competence in Using Data

Statements to measure competence in using data	Teachers (Percentage Agree and Strongly agree)	Teachers (Weighted means)
I am good at using data to diagnose student learning needs.	80%	2.88
I am good at adjusting instruction based on data.	85%	2.9
I am good at using data to plan lessons.	78%	2.83
I am good at using data to set student learning goals.	79%	2.86

Note: Percentage values indicate the combined totals of teachers who agree or strongly agree with each statement.

Teacher responses throughout this scale indicated agreement in the effectiveness of data used in pedagogy. Teachers responded most favorably to the statement, "Data help teachers plan for instruction." In fact, 88% of the teacher respondents agreed or strongly agreed with that statement. The weakest agreement was noted in the statement, "I like to use data." 76% of teacher respondents agreed or strongly agreed with that statement. Subsequently, 21% of teacher respondents responded that they disagree with the statement, "Data offer information about students that was not already known." The last two statements reveal a relative weakness regarding data for pedagogy from teacher respondents and may provide insight into the dynamic of teacher data use. This will be discussed further in chapter 5. Table 14 describes the breakdown for those that agree or strongly agree with statements related to teacher attitude toward data use effectiveness.

Similarly, the weighted means were added to the table to further delineate teacher

perceptions.

Table 14

Teacher Attitudes of Data's Effectiveness for Pedagogy

Statements Effective Data Use for Pedagogy	Teachers (Percentage Agree of Strongly agree)	Teacher (Weighted means)
Data help teachers plan instruction.	88.5%	3.09
Data offer information about students that was not already known.	78%	2.87
Data help teachers know what concepts students are learning.	93%	3.02
Data help teachers identify learning goals for students.	91%	3.04
Students benefit when teacher instruction is informed by data.	91%	3.03
I think it is important to use data to inform education practice	86%	2.98
I like to use data.	76%	2.83
I find data useful.	85%	2.95
Using data helps me be a better teacher.	79%	2.88

Note: Values represent the combined percentage of teachers that agree or strongly agree.

Teacher Collaborative Team Trust

Collaborative Team Trust is an important component required for teachers to effectively and actively use data during professional conversations. Beliefs about trust while working in teams was measured using the Collaborative Team Trust scale in the survey. The survey question asked teachers to respond to their level of agreement or disagreement with a series of statements designed to measure this scale. The four-point Likert scale ranged from strongly disagree to strongly agree.

The TDUS Teacher survey results indicated relative strong agreement that trust was present among their collaborative teams. For example, a combined 94% of teachers responded that they agree or strongly agree with the statement that, "Members of my team trust one another." While all of the statements used to measure team trust where affirmed by teachers, the weakest responses were found in the statement, "My principal or assistant principal fosters a trusting environment for discussing data in teams." A combined 89% of teacher responded in agreement or strong agreement to this statement.

Weighted means were calculated using SPSS. The weighted means offer a different lens to understand the strength of collaborative team trust scale indicated by teachers. The weighted means for this scale from all teacher respondents ranged between 3.17 and 3.31, indicating agreement in the presence of trust between team members. Table 15 below describes the weighted mean of teacher responses across each of the five statements used to measure the collaborative team trust scale.

Table 15

Collaborative Team Trust Scale for TDUS Teachers (Weighted means)

Beliefs about trust while working in teams	Teacher Responses (Weighted mean)
Members of my team trust one another.	3.31
It's ok to discuss feelings and worries with other members of my team.	3.24
Members of my team respect colleagues who lead school improvement efforts.	3.28
Members of my team respect those colleagues who are experts in their craft.	3.32
My principal or assistant principal fosters a trusting environment for discussing data in teams.	3.17

Organizational Supports for Teacher Data Use

Teachers cannot be expected to get the most out of their data without support from their central department of education and their school. The TDUS Teacher version measured organizational support for teacher data use through three scales. These scales include support for data use, principal leadership, and computer data systems. Prior to understanding the impact of each scale, it is important to review and understand teachers' accounting of which data forms are available to them.

As previously discussed, teachers responded to the question identifying which forms of data are available. The TDUS Teacher version showed that 65% of the teachers identified that Iowa Assessment data was available. Classroom performance data was identified as available by only16% of teacher respondents as available to them. The disparity between the perceived availability of the different data forms to teachers impacts the analysis regarding organizational supports. This disparity will be discussed further in chapter 5. Table 16 below highlights what data forms teachers report are available to them.

Table 16

Data Forms Available to Teachers

Data Forms	Percentage of Teachers Indicating Availability
Iowa Assessment Data	65%
Interim (Benchmark) Assessment Data	5%
School Developed Assessment Data	3%
Classroom Performance Data	16%
None of the Above	11%

School Support for Data Use

School supports for teachers using data is one scale used to measure organization supports. The TDUS survey asked teachers to indicate the range of their agreement or disagreement regarding a series of statements about the supports in place at their school. This question was posed using a four-point Likert scale which ranged from strongly disagree to strongly agree. Results from the TDUS Teacher version indicated that 76% of teachers agree or strongly agree that they are adequately supported in the effective use of data. 78% of teachers agree or strongly agree that they are prepared to use data. 76% of

teachers agree or strongly agree that someone is available to help answer data use questions.

Some statements revealed areas where teacher did not feel supported. For example, 40 % of teacher respondents disagreed and 45% of teacher respondents agreed that someone is available to help them change their practice based on data. Additionally, 45% of teacher respondents disagreed and 38% of teacher respondents agreed that either their school or their department of education provided enough professional development about data use. Finally, it is worth noting that 40% of teacher respondents disagreed and 42% of teacher respondents agreed that either their school's or their department of education's professional development was useful for learning about data use. An important consideration regarding these results is the disparity in responses regarding organization supports. This disparity will be discussed in further detail in chapter 5.

Weighted means were calculated using SPSS to demonstrate the level of support as indicated by teacher respondents. Numeric values were assigned to the range of Likert scale responses. A numeric value of one was assigned to strongly disagree and a numeric value of four was assigned to the response of strongly agree. Teacher responses revealed the highest weighted mean associated with the statement, "There is someone who answers my questions about using data," (WM = 2.84). The lowest weighted mean was associated with the statements, "My school or department of education provides enough professional development about data use" and "My school or department of education's professional development is useful for learning about data use." This weighted mean value was calculated to be 2.39. Table 17 describes the weighted means related to the statements associated with organization support as reported by the teachers.

Table 17

Teacher perceptions of Organization Support for Data Use (Weighted Means)

Support for data use statements	Teachers
I am adequately supported in the effective use of data.	2.76
I am adequately prepared to use data.	2.82
There is someone who answers my questions about using data.	2.84
There is someone who helps me change my practice (e.g. my teaching) based on data.	2.47
My school or department of education provides enough professional development about data use.	2.39
My school or department of education's professional development is useful for learning about data use.	2.39

Principal Leadership

Modeling or leading teachers in data use is an important function of school building leaders. Principal leadership in the TDUS Teacher version was measured by asking for teacher responses to the support provided by their principal and assistant

principal through a series of statements. Teachers responded to a four-point Likert scale to reveal their range from strong disagreement to strong agreement with each statement. Results from the survey indicated the following findings. 80% of teachers agreed or strongly agreed with the statement, "My principal or assistant principal encourage data use as a tool to support effective teaching." 71% of teachers reported agreement or strong agreement with the statement, "My principal or assistant principal is a good example of an effective data user." 62% of teachers reported agreement with the statement," My principal or assistant principal discuss data with me." Only 54% of teachers agreed or strongly agreed with the statement, "My principal or assistant principal create many opportunities for teachers to use data." The weakest agreement identified by teachers was found in the following two statements. Only 50% of teacher respondents reported agreement or strong agreement with these two statements, "My principal or assistant principal have made sure teachers have plenty of training for data use," and "My principal or assistant principal create protected time for using data." Protected time for professional development and data conversations is an important result which will be discussed further in chapter 5. Table 18 describes the results from the TDUS Teacher version for the Principal Leadership scale.

Table 18

Principal Leadership scale

Principal Leadership Support for Data Use	Teachers Agreement (Percentage agree and strongly agree)	Teacher Agreement (Weighted mean)
My principal or assistant principal encourage data use as a tool to support effective teaching.	80%	2.94
My principal or assistant principal create many opportunities for teachers to use data.	54%	2.58
My principal or assistant principal have made sure teachers have plenty of training for data use.	50%	2.5
My principal or assistant principal is a good example of an effective data user.	70%	2.74
My principal or assistant principal discuss data with me.	62%	2.66
My principal or assistant principal create protected time for using data.	49%	2.38

Computer Data Systems

Organization supports for teacher data use include computer data systems for

accessing and examining data. The TDUS Teacher version asked teachers to respond to a

series of statements about the computer systems provided by their school or the diocesan department of education. The statements provided responses from a four-point Likert scale indicating a range from strong disagreement to strong agreement. The results are described forthcoming.

Results from the computer data systems scale showed that 71% of teacher respondents indicated agreement or strong agreement that they have the proper technology to efficiently examine data. 71% of teachers also indicated that the computer systems in their school allow them to examine various types of data at once (e.g. attendance, achievement, demographics). 69% of teachers responded that the computer systems (for data use) in their school are easy to use. 57% of teachers indicated that the computer systems in their school provide them access to lots of data, while 62% of teachers answered that the computer systems in their school generate displays (e.g. reports, graphs, tables) that are useful to them.

While the above results offer significant agreement regarding computer data systems available to teachers, it is important to note that with these responses, a significant number of teachers did not feel that support inherent in shared computer systems. For example, at least 28% of teacher respondents indicated this disagreement with each statement. This finding provides an opportunity for deeper discussion in chapter 5. Table 19 describes the results from the computer data systems scale.

Table 19

Computer Data Systems Scale

Scale Statements	Teacher Responses (Percentage Agree or Strongly Agree)	Teacher Responses (Weighted Means)
I have the proper technology to efficiently examine data.	71%	2.77
The computer systems in my school provide me access to lots of data.	58%	2.59
The computer systems (for data use) in my school are easy to use.	69%	2.71
The computer systems in my school allow me to examine various types of data at once (e.g. attendance, achievement, demographics).	71%	2.81
The computer systems in my school generate displays (e.g. reports, graphs, tables) that are useful to me.	62%	2.67

Hypothesis 2: There is a positive correlation between teacher data use practices, attitudes, organizational supports and team trust for teachers to incorporate data use to drive instructional decisions.

The TDUS Teacher version included scales or a series of questions designed to measure components which may impact teacher data use. Respondent data from each of

scales within the TDUS Teacher version was transformed using SPSS to create scale means. Scale means were then analyzed to ascertain if a statistical relationship exists between each scale. Scale means were computed as bivariate measures. The scales for this analysis include the following components: a.) Data competence, b.) Data's Effectiveness for Pedagogy, c.) Principal Leadership, d.) Computer Data Systems, e.) Collaborative Team Trust.

A number of significant positive correlations were found between these scales. The Data Competence scale and the Data's Effectiveness for Pedagogy scale were strongly positively correlated, r (158) = .618, $p < .05$. The Data Competence scale and the Principal Leadership scale were positively correlated, r (158) = .495, $p < .05$. The Principal Leadership scale and the Computer Data Systems scale were strongly positively correlated, r (158) = .548, $p < .05$. The Principal Leadership scale and the Collaborative Team Trust scale were positively correlated, r (158) = .350, $p < .05$. Additionally, the Computer Data Systems scale and the Data Competence scale were positively correlated, r (158) = .333, $p < .05$. Finally, the Data's Effectiveness for Pedagogy scale and the Computer Data Systems scale were positively correlated, r (158) = .248, $p < .05$. A summary of results is presented in Table 20.

A correlation analysis was also conducted using SPSS to determine the extent of the relationship between the Actions with Data scale means and the scale means used to measure Data Competence, Data's Effectiveness for Pedagogy, Principal Leadership, Computer Data Systems and Collaborative Team Trust. The scale means that comprise the Actions with Data include the following components: a.) Data Actions with Iowa Assessment, b.) Data Actions with Interim (Benchmark) Assessment, c.) Data Actions

with School Developed Assessment, d.) Data Actions with Classroom Performance

Assessment.

Table 20

Summary of Correlation Among Teacher Data Use Survey Scale Means

Data Use Scales	Data Competence	Data's Effectiveness for Pedagogy	Principal Leadership	Computer Data Systems	Collaborative Team Trust
Data Competence	-	.618*	.495*	.333*	.089
Data's Effectiveness for Pedagogy	.618*	-	.492*	.248*	.077
Principal Leadership	.495*	.492*	-	.548*	.350*
Computer Data Systems	.333*	.248*	.548*	-	.176*
Collaborative Team Trust	.135	.077*	.350*	.026	-

Note: * Correlation is significant at the .05 level (2-tailed).

There were a limited number of significant positive correlations found as a result

of this analysis. For example, the Data Competence scale means were positively

correlated with the scale means of the Data Actions with Classroom Performance

Assessment, r (158) = .351, $p < .05$, the Data Actions with Interim (Benchmark)

Assessment, r (158) = .239, $p < .05$, and the Data Actions with School Developed

Assessments, r (158) = .223, $p < .05$. Additionally, Principal Leadership scale means

were positively correlated with scale means of the Data Actions with Iowa Assessments,

r (158) = .241, $p < .05$, the Data Actions with Classroom Performance Assessment, r

(158) = .174, $p < .05$. Finally, positive correlations were revealed between the scale

means from Computer Data Systems and Data Actions with the Iowa Assessment, r (158) = .185, $p < .05$, the Data Actions with School Developed Assessments, r (158) = .217, $p < .05$, and the Data Actions with Classroom Performance Assessment, r (158) = .163, $p < .05$. A summary of the results may be found in Table 21.

Table 21

Summary of Correlation Analysis of Actions with Data Scale Means

Data Scales	Data Actions: Iowa Assessment	Data Actions: Interim (Benchmark Assessment	Data Actions: School Developed Assessments	Data Actions: Classroom Performance Assessment
Data Competence	.116	.239*	.223*	.351*
Data's Effectiveness for Pedagogy	.151	.166*	.079	.113
Principal Leadership	.241*	.058	.073	.174*
Computer Data Systems	.185*	.095	.217*	.163*
Collaborative Team Trust	.109	.027	.033	.068

Note: * Correlation is significant at the .05 level (2-tailed).

The hypothesis indicating that there is a positive correlation between teacher data use practices, attitudes, organizational supports and team trust for teachers to incorporate data use to drive instructional decisions may only be partially accepted. Strong positive correlations were identified between the scaled means Data Competence with Data's Effectiveness for Pedagogy and Principal Leadership. Also, strong positive relationships were identified between the scaled means of Data's Effectiveness for Pedagogy with Principal Leadership. Finally, strong positive correlations were identified between

Principal Leadership and both the Computer Data Systems scale means and Collaborative Team Trust. The remaining results indicate a weak correlation or no significant relationship between the scales.

The positive correlations identified between the scaled means of the Data Actions and the corresponding attitudes, pedagogy, supports and team trust tend to be regarded as not strong. The strongest relationship was identified between Data Competence and Data Actions with Classroom Performance Assessment. However, this reported value, r (158) = .351, p < .05, indicates a moderate relationship. The Collaborative Team Trust scale mean was not found to have a correlation with any of the Data Action assessment types.

Results for Research Question 3

How do administrators and instructional support staff view teachers use of data to support instructional decisions?

Alternate versions of the Teacher Data Use Survey (TDUS) were administered to administrators and instructional support staff in order to further the researcher's understanding of teacher data use within this system of elementary schools. Results described herein are based on the results of these two survey versions created following the guidelines established by the developers of the survey (Wayman, et al., 2017).

The Teacher Data Use Survey identified specific data sources which may be used by teachers in their instructional practice. The data sources included the following list of assessment data sources: a.) Iowa Assessments, b.) Interim (Benchmark) Assessments, c.) School developed assessments, d.) Classroom performance assessments, e.) other assessments. 100% of administrators and 67% of instructional support staff identified the

availability of Iowa Assessment data for teacher use. Interim (Benchmark) assessment data was identified by 33% of the instructional support staff respondents as an available data source. It is worthwhile noting that neither administrators nor instructional support staff indicated the availability of other assessment data sources for teachers.

Attitudes Toward Data

Frequency of use for each data form provided this researcher with insight regarding each assessment data form. Administrators and instructional support staff responded to a five-point Likert scale questions asking how frequently teachers use each data form. The range of answers included do not use, less than once a month, once or twice a month, weekly or almost weekly, and a few times a week. Administrators revealed that teachers in their schools use the different forms of data to plan for instruction at varied rates. Administrators perceive classroom performance assessments to be used the most frequently. In fact, 50% of the administrators responded their teachers use classroom performance data at least weekly or almost weekly. 35% of administrators responded that their teachers use the classroom performance assessment data source a few times a week. It should be noted that only 5% of administrators perceived school developed performance assessments to be used a few times a week. Data from annual assessments (Iowa assessment data) and interim benchmark assessments are not used that frequently at all. 70% of administrators believed that their teachers used Iowa assessment data less than once per month. Administrators do acknowledge that teachers may use periodic benchmark assessments weekly or almost weekly at a rate of 22%. It should also be noted that administrators see their teachers using data types at a rate of less than once

per month as follows: Iowa Assessment Data (70%), Interim Benchmark Assessment

Data 28%, School Developed Assessment Data (16%).

Weighted means were calculated from the responses provided by the Instructional

Support staff. The Instructional Support Staff respondents revealed that teachers in their

schools use each of the forms of data to plan for instruction at different frequencies. The

weighted means ranged from a high for classroom performance assessment data (WM =

4.25), school developed assessment data (WM = 4.0), Interim Benchmark Assessment

Data (WM = 2.75) and Iowa Assessment Data (WM = 2.25).

Table 22 below describes the weighted means of frequency of use for data forms

as perceived by administrators and instructional support staff. The range of responses

from this question on the survey began with "Do Not Use" to "A few times a week." A

weighted mean of 5 indicated that the perceived usefulness of each data form was used a

few times a week. It is necessary to note that the "Other "assessment data form identified

by the instructional support staff as being used most frequently, it was not identified

specifically. This researcher cautions the reader regarding the importance of this value

since no additional information was provided in spite of the survey providing the option

to add this information.

Administrators and instructional support staff responded to a survey question

regarding the usefulness of each assessment data form to teachers' practice. The survey

provided a five-point Likert scale range of responses from not useful through very useful.

The results revealed that 63 % of administrators and 75% of instructional support staff

perceived that classroom performance assessment data was very useful to teachers. Only

53% of administrators and 50% of instructional support staff viewed school developed

performance data as very useful to teachers. Additionally, 35% of administrators and

50% of instructional support staff viewed periodic benchmark assessments as very useful,

while 25% of administrators and instructional support staff viewed Iowa Assessment

Data as very useful.

Table 22

Perceived Frequency of Use of Assessment Data Forms (Weighted mean)

Respondent Group	Iowa Assessment Data	Interim (Benchmark) Assessment Data	School Developed Assessment Data	Classroom Performance Assessment Data	Other Assessment Data
Administrators	2.3	2.61	2.79	4.2	1.5
Instructional Support Staff	2.25	2.75	4	4.25	5

Weighted means of responses from each subgroup were calculated in SPSS.

Based on the weighted means of responses, classroom performance assessment data was

considered the most useful. Table 23 below compares the weighted means between the

administrator subgroup and instructional support staff subgroup regarding their

perceptions of the usefulness of each assessment data form to teachers. A weighted mean

of 5.0 would indicate a Likert response of very useful. The respondents from the

Instructional Support Staff subgroup identified that other assessment data forms were

very useful, as indicated by the weighted mean value of four. It was noted that only one

example from this subgroup was identified specifically for other assessment data forms.

This was identified as IXL. IXL is a subscription based online learning platform for K -

12 students. The assessment data gathered from this site would fall primarily within the

classification of classroom performance assessment data.

Table 23

Perceived Usefulness of Assessment Data to Teachers' Practice (Weighted mean)

Assessment Data Forms	Administrator	Instructional support staff
Iowa Assessment Data	2.75	3.0
Interim (Benchmark) Assessment Data	3.05	3.5
School Developed Assessment Data	3.33	3.5
Classroom Performance Assessment Data	3.63	3.75
Other	2.75	4

Actions with Data

Understanding the frequency of actions that teachers take with assessment data

through the lens of administrators and instructional support staff can provide important

information to the understanding of teacher data use. The TDUS surveys for both the

administrator and the instructional support staff used a four-point Likert scale with

responses which ranged from one or two times a year to weekly to gauge the frequency of

teacher actions. This process was reported for each assessment data form including the

following assessments, a.) Iowa Assessment Data, b.) Interim (benchmark) Assessment

Data, c.) School Developed Assessment Data, and d.) Classroom Performance

Assessment Data. Table 24 describes the results from both surveys. Weighted means

were calculated through SPSS to provide an indication of frequency of use. For example,

a weighted mean of four would indicate a frequency of weekly.

The results from both survey groups demonstrated a perceived minimalist use of Iowa Assessment data. A weighted mean between one and two indicates that each action with Iowa Assessment data occurs at most between one or two times a year or a few times a year. Both survey groups indicated agreement that the most frequent data use actions made by teachers occur with classroom performance assessment data. The weighted mean values for both subgroups was three or higher across most data actions, which indicates a frequency approaching weekly. Among the least frequent data actions, across all assessment data forms, and from each subgroup, consistently identified discussing data with a parent, discussing data with a student, and meeting with an instructional or data specialist to discuss data. This result is meaningful and will be discussed further in chapter 5.

Collaborative Team Actions

Actions which teacher teams take with data as a part of a collaborative inquiry cycle have been measured in the collaborative team actions scale. Table 25 below describes the weighted means of each subgroup regarding the frequency of each action described. Administrators and instructional support staff were asked how often their collaborative teams perform a series of actions. The survey provided a four-point Likert scale of responses which ranged in frequency from never to a lot. A weighted mean of four would indicate a response of a lot. In summary, administrators weighted means tended to be lower than those of the instructional support staff. This means that administrators perceive a less frequent collaboration than indicated by the responses of the instructional support staff.

Table 24

Perceived Frequency of Teacher Actions Using Iowa Assessment Data (Weighted mean)

Data Actions	Iowa Assessment Data		Interim (Benchmark) Assessment Data		School Developed Assessment Data		Classroom Performance Assessment Data	
	Admin.	Inst. Support Staff (ISS)	Admin.	ISS	Admin.	ISS	Admin.	ISS
Use data to identify instructional content to use in class.	1.6	1.0	1.8	1.75	2.54	2.0	3	3.0
Use data to tailor instruction to individual students' needs.	1.6	1.25	1.86	1.75	2.62	2.0	3.19	3.0
Use data to develop recommendations for additional instructional support.	1.65	1.5	1.93	1.75	2.69	2.0	3.06	3.33
Use data to form small groups of students for targeted instruction.	1.5	1.75	2	2	2.69	2.0	2.94	3.25
Discuss data with a parent or guardian.	1.42	1.0	1.8	1.5	2.38	1.67	2.38	2.67
Discuss data with a student.	1.27	1.0	1.69	1.33	2.46	1.67	2.47	2.67
Meet with a specialist (e.g. instructional coach or data coach) about data.	1.39	1.5	1.71	1.33	2.17	2.0	2.27	2.67
Meet with another teacher about data.	1.47	1.33	1.87	1.75	2.31	2.0	2.56	3.0

Administrator responses indicated a general frequency of collaborative team actions between sometimes and often. Instruction support staff responses indicated a general frequency of collaborative team actions between often and a lot. Administrators perceived that teachers explore data by looking for patterns and trends the most frequently, (WM = 2.93), while instructional support staff perceived that teachers discuss pedagogy changes and consider possible student outcomes as a result the most frequently, (WM = 3.67). The least frequent action indicated by administrators was identified as approaching an issue by looking at data (WM = 2.6), while the for the instruction support staff subgroup, the least frequent action identified was discussing preconceived ideas about an issue and identifying questions that the group will seek to answer using data (WM = 3.0). Table 25 describes the results obtained from each subgroup for the Collaborative Team Actions scale.

Collaborative Team Trust Scale

Beliefs about trust while working in teams forms the basis of the Collaborative Team Trust scale. Each subgroup was surveyed regarding their school's collaborative teams. The survey provided a four-point Likert scale for a range of responses indicating strongly disagree to strongly agree. A weighted mean of four would indicate strong agreement with the statement. The strongest weighted mean identified by the administrator respondents, indicated that members of my team trust one another, (WM = 3.4). The weakest measure of agreement by administrators showed that it's ok to discuss feelings and worries with other members of the team, (WM = 3.07). The instructional support staff respondents strongest measure of agreement identified that my principal or assistant principal fosters a trusting environment, (WM = 3.75).

Table 25

Frequency of Collaborative Team Actions Scale (Weighted means)

Collaborative Team Actions	Administrators	Instructional support staff
We approach an issue by looking at data.	2.6	3.25
We discuss our preconceived beliefs about an issue.	2.67	3.0
We identify questions that we will seek to answer using data.	2.73	3.0
We explore data by looking for patterns and trends.	2.93	3.33
We draw conclusions based on data.	2.87	3.25
We identify additional data to offer a clearer picture of the issue.	2.8	3.25
We use data to make links between instruction and student outcomes.	2.8	3.5
When we consider changes in practice, we predict possible student outcomes.	2.67	3.67
We revisit predictions made in previous meetings.	2.73	3.33
We identify actionable solutions based on our conclusions.	2.8	3.5

Conversely, the weighted means revealed that the instructional support staff perceived

that their weakest level of agreement was indicated by the statement, "It's ok to discuss

feelings and worries with other members of my team," (WM = 3.33). Table 26 describes

the results obtained from administrator and instructional support staff respondents for the

Collaborative Team Trust scale.

Table 26

Collaborative Team Trust Scale (Weighted means)

Collaborative Team Trust Statements	Administrators	Instructional Support Staff
Members of my team trust one another.	3.4	3.5
It's ok to discuss feelings and worries with other members of my team.	3.07	3.33
Members of my team respect colleagues who lead school improvement efforts.	3.13	3.5
Members of my team respect those colleagues who are experts in their craft.	3.2	3.5
My principal or assistant principal fosters a trusting environment for discussing data in teams.	3.33	3.75

Competence in Using Data

Perceptions about how good teachers are at using data to inform various aspects

of their practice make up the data competence scale. The survey sought to understand

administrators and instructional support staff attitudes toward their teachers' use of data.

The survey asked respondents to respond to a series of statements with using a four -point

Likert scale ranging from strongly disagree to strongly agree. A scale value of 4 was

assigned to strongly agree. Administrators identified the highest agreement that their

teachers are good at using data to diagnose student learning and using data to set student

learning goals, (WM = 2.81). The weakest weighted mean identified by the administrator

subgroup was using data to adjust instruction and using data to plan lessons, (WM = 2.63). Instructional support staff responded more favorably regarding the competence of their teachers to use of data. Weighted means for all four statements ranged between 3.25 and 3.75, indicating agreement or strong agreement in all statements. Table 27 below describes the weighted means by subgroup for each competency statement.

Table 27

Perceptions of Teacher Competence in Using Data (Weighted Means)

Teacher Competence Statements	Administration	Instructional Support Staff
My teachers are good at using data to diagnose student learning.	2.81	3.25
My teachers are good at adjusting instruction based on data.	2.63	3.75
My teachers are good at using data to plan lessons.	2.63	3.75
My teachers are good at using data to set student learning goals.	2.81	3.5

Organizational Supports for Data Use

Organization supports for data use were measured using three different scales. These are described by the following components: a.) Support for Data Use, b.) Principal Leadership, and c.) Computer Data Systems. The Support for Data Use scale investigated the specific supports in place at schools for teachers when using data. The Principal Leadership scale measured the perceptions regarding the leadership from principals and assistant principals in using data. The Computer Data Systems scale measured the perceptions regarding the technology available for assessing and examining data.

The Support for Data Use scale was measured using a four-point Likert scale to determine the extent of agreement or disagreement with a series of statements designed to measure the perceptions of school building leaders and instructional support staff. The strongest agreement from principals and assistant principals was found in the statement, "There is someone who answers my teachers' questions about using data." In fact, 43% of principals and assistant principals strongly agreed and 25% agreed with this statement. The weakest level of agreement by this subgroup was identified in the statement, "My school or department of education's professional development for my teachers is useful for learning about data use." Only 6% of principals and assistant principals strongly agreed while 50% responded that they agreed with the statement.

The instructional support staff subgroup identified a higher level of agreement with the series of support statements used to measure the Support for Data Use scale. In fact, 67% of instructional support staff indicated strong agreement and 33% agreed with the statement that someone is available to answer teacher questions regarding data use. Similar to the school building leader responses, the survey results indicated that the instructional support staff perceived a relative weakness in professional development for teachers to learn about using data.

The Principal Leadership scale asked about how principals and assistant principals lead teachers in using data. The survey utilized a four-point Likert scale identifying the range of agreement with a series of statements about principal leadership. Instructional support staff overwhelming identified agreement in their responses with statements about principal leadership in their schools. In fact, the highest agreement identified with the responses was found in the statement, "My principal or assistant

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principal encourages data use as a tool," (WM = 3.75). The lowest weighted mean

reported was for the statement, "My principal or assistant principal creates protected time

for suing data," (WM = 2.50).

On the TDUS Administrators version, the same statements were used but

formatted in the first person. Principals and assistant principals identified the same above

two statements as the highest weighted mean and the lowest weighted mean. This finding

supports the perception that while data use is encouraged by school leadership,

identifying protected time for these practices remains a challenge. Table 28 below

describes the weighted means for each leadership statement by administrators and

instructional support staff.

Table 28

Principal Leadership Scale (Weighted Means)

Leadership Support Actions	Administration	Instructional Support Staff
Leadership encouraged data use as a tool to support effective teaching.	3.44	3.75
Leadership created many opportunities for teachers to use data.	2.81	3.50
Leadership made sure teachers have plenty of training for data use.	2.88	3.00
Leaders are a good example of an effective data user.	3.13	3.50
Leaders discuss data with their teachers	3.25	3.75
Leaders create protected time for using data.	2.63	2.50

The computer data system scale asks about technology for accessing and examining data. The survey question used a four-point Likert scale of responses to measure agreement or disagreement with a series of statements about the types of computer systems available to teachers. A weighted mean of four would indicate strong agreement. Specific results from administrator respondents identified that 56% agree and 25% strongly agree that the computer systems in their school generate displays that are useful in the form of reports, graphs and tables. This was the weakest response found from the administrators. The instructional support staff respondents identified the statement that the computer systems in their school allow them to examine various types of data at once, such as attendance, achievement, and demographics as the weakest agreement associated with this scale. The highest agreement from administrators was identified with the statement, "The computer systems in my school provide me access to lots of data." 62% of administrators agreed and 32% strongly agreed with that statement. Overall, the weighted means for all of the responses identified a positive agreement for the computer data systems in use at their respective schools. Table 29 below describes the weighted means for each statement for the Computer Data Systems scale by administrator and instructional support staff.

Table 29

Computer Data Systems Scale (Weighted Means)

Statements regarding computer data systems.	Administration	Instructional Support Staff
The school has the proper technology to efficiently examine data.	3.19	3.25
The computer systems in the school provide access to lots of data.	3.25	3.00
The computer systems (for data use) in my school are easy to use.	3.19	3.00
The computer systems in my school allow me to examine various types of data at once (e.g. attendance, achievement, demographics)	3.2	2.67
The computer systems in my school generate displays 9e.g. reports, graphs, tables) that are useful to me.	3.06	3.00

CHAPTER 5: Discussion

Introduction

Data use in education is not new to teachers, administrators, students, parents, or even state and federal education agencies. However, a systematic approach for teachers to use multiple data forms to drive educational decision making is limited. It is more typical to see examples of data use by school administration, data use by systems of schools or data use with state and federal agencies (Mandinach and Jackson, 2012; Schifter, et al., 2014). Research examining connections between data driven decision making and improved student learning outcomes is inconclusive (Mandinach et al., 2006; Sun et al., 2016). Currently, there remains a relatively small body of research targeted at quantifying data use (Sun et al., 2016; Wayman, Jeffrey & Cho, 2017).

The purpose of this quantitative research study was to investigate the perceptions of teachers, administrators, and instructional support staff regarding teachers' use of data to support instruction, their attitudes toward data, and the institutional supports that help teachers use data within a Catholic diocesan elementary school system. Additionally, this research study sought to extend the limited body of quantitative research regarding teacher data use by analyzing the resulting data through the lens of Sociocultural Theory.

The significance of this research study lies in the descriptive results of one Catholic diocesan elementary school system's progress toward the USCCB's National Standards and Benchmarks for Effective Catholic Elementary and Secondary Schools which highlight the necessity of data driven decision making. The findings from each of the versions of the Teacher Data Use Survey (TDUS) for teachers, administration, and instructional support staff have provided the researcher meaningful insights into the

actions that teachers take with specific assessment data forms, perceptions regarding

teacher competence in using data, attitudes toward data use, teacher collaborative

practices with data and the perceptions of support for data use provided by the

organization, including school level support and the diocesan department of education for

all schools within the system.

Interpretation of the Results

The conceptual framework which underpinned this study can be used to describe

the implications of the findings herein. The conceptual framework presented in chapter

one is illustrated below in Figure 2. The conceptual framework presented provided

important links between the tenants of Sociocultural Theory, Data Driven Decision

Making, Data Inquiry, and Student-Centered Instructional Design and Practice.

The results of the Teacher Data Use Survey from all three subgroups (i.e.

teachers, administrators, and instructional support staff) and the analysis previously

described in chapter 4 provided valuable insight into the data use practices of teachers in

this system of schools. It is important to identify that this administration of the TDUS

resulted in Cronbach alpha statistics for each scale at 0.94 or higher. This further

demonstrates the reliability of this survey tool in search of deeper understanding

regarding teacher data use practices. As further research is conducted to investigate the

data use practices of teachers, researchers can use this tool to provide more information

about its reliability.

This descriptive correlational study included analysis to answer three primary

questions. Research question 1 examined the extent which teachers use data to support

instructional decisions. Research question 2 examined the extent to which specific

components impacted teachers use of data to support instructional decisions. These surveyed conceptual components included teacher competence in using data, teacher attitudes toward data, teacher collaborative team trust, and organizational supports for teachers' data use. Research question 3 examined the perceptions of administrators and instructional support regarding teachers use of data to support instructional decisions.

Figure 2

Conceptual Framework of Data Driven Decision Making
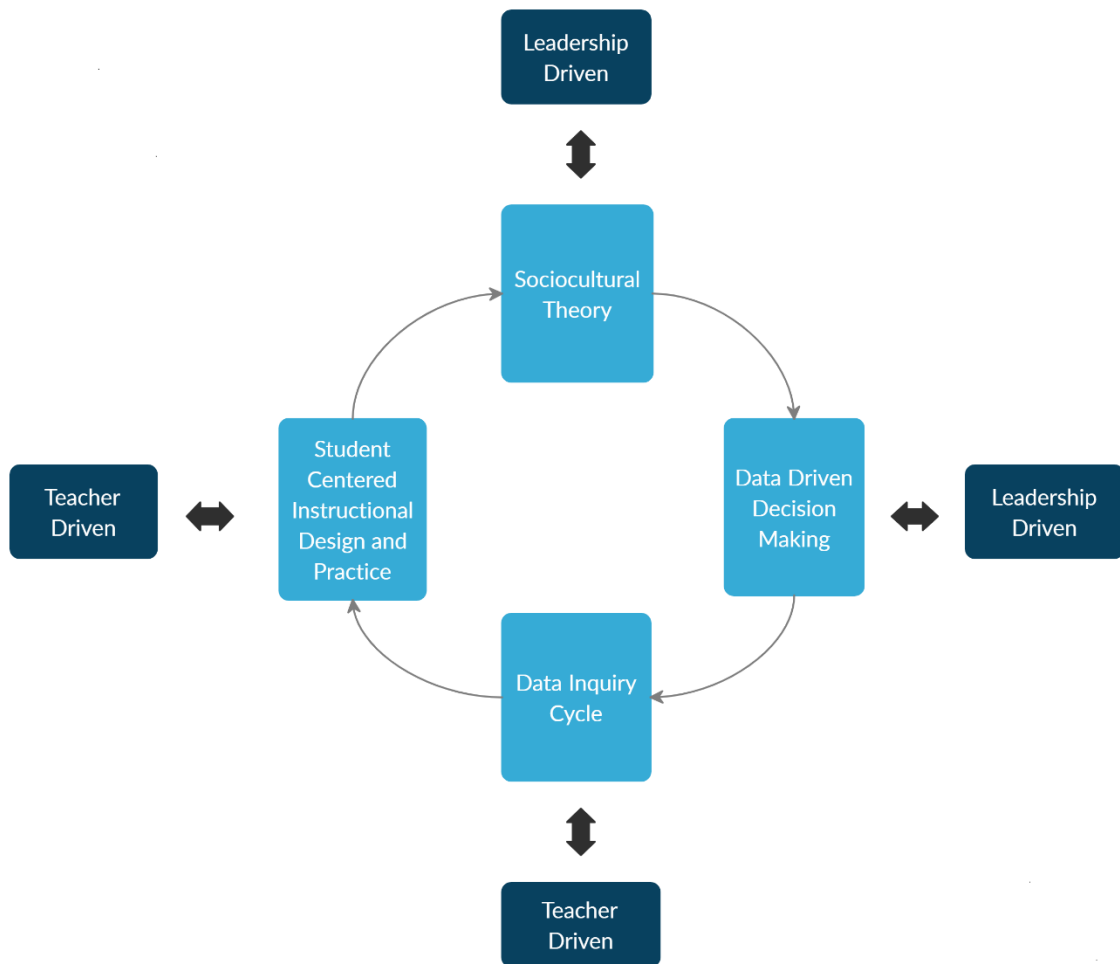
The Teacher Data Use Survey measured five conceptual components comprised of nine scales. The conceptual components and scales included in the survey are identified Table 30.

Table 30

Organization of Teacher Data Use Survey Components and Scales

	Components of Data Use				
	Actions with Data	Competence in Using Data	Attitudes Toward Data	Collaboration	Organizational Support
Scales	Frequency of use for Planning Instruction (Not a scale)	Data Competence	Perceptions of Data Usefulness (Not a scale)	Collaborative Team Trust	Data Forms Available (Not a scale)
	Actions with Data		Data's Effectiveness for Pedagogy		Support for Data Use
	Collaborative Team Actions		Attitudes Toward Data		Principal Leadership
					Computer Data Systems

SPSS was used to calculate scale means. Bivariate correlation analysis was conducted to examine statistical relationships between scales. Positive correlations were identified between scales, as described in chapter 4. The analysis demonstrated a statistical relationship or correlation, between specific data use practices, teachers attitudes toward data use, and structural supports for teachers to incorporate data use.

Positive correlations were identified between teachers' perceptions of the usefulness of data and the frequency of use in planning for instruction. The frequency of

use in planning for instruction item delineated between specific data use actions with each assessment data form including the Iowa Assessment data, interim (benchmark) assessment data, school developed assessment data, and classroom performance assessment data. This is significant because it tells us in plain language that teachers will likely incorporate the use of assessment data more frequently when they perceive it to be useful. This provides administrators a justification and a pathway to provide the professional development required to improve teacher's understanding and capacity regarding the usefulness of each data form. Other results in this study supported the understanding that incorporating data driven decision making within a systematic approach to deliver student centered instruction involves a complex understanding of data use and its application in the classroom.

Positive correlations were identified between the scale means for Collaborative Team Actions and the scale means for Actions with Data with Iowa Assessments and the Actions with Data with Classroom Performance Assessment Data. The Collaborative Team Actions scale identifies specific actions that school data teams, including teachers, administrators and instructional support staff, may take with data as a part of a collaborative inquiry cycle. Descriptive results from teacher respondents showed that certain elements within the Collaborative Team Action scale were more frequently applied to teacher data use practices. Collaborative Team Actions such as discussing preconceived beliefs about an issue, or drawing conclusions based on data were some of the actions that teachers were already utilizing with fidelity. The identified connection between Collaborative Team Actions and specific actions teachers may take with each

assessment data form may demonstrate an important link for administrators and school data teams to develop their data inquiry skills.

The conceptual framework displayed in Figure 2, highlights the importance of developing a data inquiry cycle to support student centered instructional design. Through a data inquiry cycle, data teams can establish instructional hypotheses, develop instructional interventions, gather and analyze additional performance data (Mandinach & Jackson, 2012; Mertler, 2014). This cycle of inquiry allows teachers to identify the critical learning elements and design an instructional plan to meet each students' needs.

However, if the findings from this study are able to be applied, then school leaders and diocesan administration may need to focus time, resources and professional development to strengthen all of their collaborative team actions. This may build teacher capacity for data use and lead to more widespread use of other forms of data, as well. Table 31 highlights the individual actions within this scale for consideration. Understanding this provides a future research focus which was not a part of this current study.

Positive correlations were identified between the scale means for Principal Leadership and the scale means for Actions with Data with Iowa Assessments and the Actions with Data with Classroom Performance Assessment Data. The Principal Leadership scale examined perceptions regarding the principal and assistant principal leading teachers using data. This finding highlights the importance the importance of Principal Leadership to support teacher data use practices.

Table 31

Comparison of the Collaborative Team Actions Scale and Actions with Data Scale

Collaborative Team Actions	Actions with Data
Approach an issue by looking at data.	Identify instructional content based on data.
Discuss preconceived beliefs about an issue.	Tailor instruction to individual students' needs.
Develop questions to answer using data.	Make recommendations for additional instructional support.
Explore data by looking for patterns and trends.	Form small groups of students for targeted instruction.
Draw data-based conclusions.	Discuss data with a parent.
Identify additional data to provide clarity for the issue.	Discuss data with a student.
Use data to make links between instruction and student outcomes.	Meet with a specialist about student data.
Predict possible student outcomes based on identified changes in practice.	Meet with another teacher about student data.
Analyze efficacy of predictions in future meetings.	
Use data-based conclusions to identify actionable solutions.	

Referring back to the image of the conceptual framework (Figure 2), leadership was identified as an important connector between the application of Sociocultural theory and Data Driven Decision Making. Sociocultural theory supposes that learning is embedded within social events, in this instance, events within a school day. Development and learning are facilitated within the social environment. Leadership or a more knowledgeable other as identified by the research is critical in supporting learning through discourse, modeling, scaffolding and collaboration (March & Farrell, 2015b; Schunk, 2016; Vygotsky, 1978).

As the evolving field of research regarding our understanding of the process of data driven decision making has identified, leadership at the school level is one of the most important factors required to develop and sustain this systematic approach (Mandinach & Jackson, 2012; Marsh & Farrell, 2015b; Wayman, Jeffrey, & Cho, 2017). This leadership includes both the principal and in cases where present, the assistant principal. School leaders demonstrate support for data driven decision making through their actions. Such actions may include the following as identified in this scale within the TDUS: a.) Encouraging data use as a tool to support effective teaching, b.) Creating regular opportunities for teachers to use data, c.) Ensuring that teachers have the necessary training for data use, d.) Modeling data use for decision making for teachers, e.) Discussing student assessment data with teachers, f.) Ensuring that teachers have protected time for using data. Table 32 compares the tenants of Sociocultural theory with the Principal Leadership scale actions.

Table 32

Comparison of Sociocultural Theory and Principal Leadership Scale

Components of Sociocultural Theory	Principal Leadership Actions Scale
Discourse	Encouraging data use as a tool to support effective teaching
Modeling	Creating regular opportunities for teachers to use data
Scaffolding	Ensuring that teachers have the necessary training for data use
Collaboration	Modeling data use for decision making for teachers
	Discussing student assessment data with teachers
	Ensuring that teachers have protected time for using data

Positive correlations were identified between the scale means for Computer Data

Systems and the scale means for Actions with Data with Iowa Assessments, the Actions

with Data with School Developed Assessments, and the Actions with Data with

Classroom Performance Assessment Data. The Computer Data Systems scale examined

the technology available to teachers for accessing and using various forms of assessment

data. These results demonstrate the interconnectedness between teacher data use and the

technological supports required to maximize teacher data use within their instructional

practice. The Computer Data Systems scale examined the extent to which the school or

diocesan department of education provided systematic support to access, synthesize and

evaluate assessment data. Specifically, this scale measured the following five items: a.)

the proper technology in place to efficiently examine data, b.) computer systems in place

provide varied and extensive data access, c.) computer systems for data use are easy to

use, d.) computer systems allow teachers to examine a variety of student data at once, e.)

computer systems generate useful displays (i.e. graphs, charts, reports).

The conceptual framework (Figure 2) can be used to further the understanding of

this connection. Data Driven Decision Making is a systematic collection, examination,

analysis, interpretation, and application of data to inform instructional, administrative,

policy and other decisions and practice (Mandinach & Jackson, 2012; Mertler, 2014;

Schifter, 2014). Computer data systems would naturally be an inherent tool required to

support this process. The systematic process of data driven decision making is wholly

comprised of a data vision, the data culture, data tools, data collaboration and data

literacy. Data tools include computer data systems and the items that make up the scale.

This study included the administration of three versions of the Teacher Data Use Survey to determine perceptions of teachers, administrators and instructional support staff. The descriptive component of this study enriches the significant findings herein. For example, a comparison of the results from each survey version regarding which assessment data forms are available to teachers revealed significant information. Additionally, the results regarding the frequency of use of each assessment data form, and the usefulness of each assessment data form provide meaningful insight. All three subgroups, the teachers, the administrators, and the instructional support staff, identified that the Iowa Assessment data was the most available data form but the least frequently used and the least useful assessment data form to teacher practice. Classroom performance assessment data was identified by all three subgroups as the most frequently used.

The Iowa Assessments represent an annual, diocesan wide assessment. These assessments are designed to measure student achievement and growth in valid and reliable ways. They assess student skills in reading, language, and mathematics and provide national and local comparisons. The finding that all three subgroups identified this assessment form the least useful to teacher practice and was used the least frequently is significant. Exploring why this seems to be the case is likely to assist the system of schools when identifying future areas of improvement. The current study did not explore this question.

As previously stated, classroom performance assessment data was found by all three subgroups as the most useful and the most frequently used assessment data form. While this finding was not unexpected, it is significant because it provides leadership

within the system of schools an understanding of the lack of balance teachers have regarding each assessment data form.

The TDUS sought to identify which assessment data forms were available to teachers. The survey categorized assessment data forms into annual assessment data, periodic assessment data, school developed assessment data, and ongoing classroom performance assessment data. Teachers were also provided the opportunity to identify other assessment data forms they used in their instructional practice. Eight of the 15 other assessment data forms identified by teachers were actually examples of classroom performance assessment data. The remaining seven items included data forms from other categories already being measured by the TDUS and in some cases, items identified were not forms of assessment data. Other researchers have identified the prevalence of teacher misunderstanding surrounding assessment data. The results of this survey question support the existing research.

The Actions with Data scale measured actions that teachers take with each data form. This scale was measured through a series of statements representing actions teachers may take with data. Of significance, the Actions with Data scale across all four assessment data forms identified the limited use of assessment data to have conversations with parents, to have conversations with students and to meet with a specialist to discuss data.

The conceptual framework (Figure 2) highlights the interplay of sociocultural theory, a systematic approach to data use, and an end result that seeks to support a student-centered instructional design and practice. Sociocultural theory predicates learning through discourse. Conversation is critical to the learning process. Improving

teacher capacity for conversations with parents, students and data specialists is a critical step along the continuum of data driven decision making. This is also a critical step toward increasing teacher capacity for developing student-centered instruction.

Understanding data competence provided the researcher information about how good teachers perceive themselves to be at using data to inform various aspects of their practice. The descriptive results from this survey scale item, Teacher Competence in Using Data scale, revealed that teachers perceive data use to diagnose student learning needs, and to adjust instruction based on data as a relative strength, while using data to plan lessons and to set student learning goals is a relative weakness. This is a significant finding as it provides system leaders insight into teachers' planning process. Using student assessment data to plan future instruction and to establish learning goals is a critical component of a student-centered instructional design and practice. Understanding why this is a relative weakness was not a part of this study but may be an area of interest for future research.

The Collaborative Team Trust scale measured beliefs about trust while working in teams. The results from the Collaborative Team Trust scale were aligned between all three survey versions and indicated a belief in the presence of trust while working in teams. Trust is an essential factor in the development of a culture of data use (Matters, 2006). Research has also identified that some teachers' reluctance to use data tools is ground in mistrust of data (Mandinach, et. al., 2006). The conceptual framework (Figure 2) can be used to describe the significance of this descriptive finding through all three survey versions. Inherent within Sociocultural theory is the premise of a supporting relationship between learner and the more knowledgeable other to create opportunities

for discourse, modeling, scaffolding, and collaboration. Without established trust, this process will not be meaningful.

The Support for Data Use scale measured school supports for teachers using data. All three subgroups shared their perceptions about the support available for effective data use, their preparation for effective data use, the presence of a person to answer questions about data, the availability of a person available to help change an instructional practice based on data, professional development to support data use, and the perceived usefulness or quality of professional development for data use. Teacher respondents and instructional support staff respondents identified that the quantity and quality of professional development to support data use is a relative weakness. This research study did not seek to understand why teachers and instructional support perceived professional development as a weakness. However, investigating this discrepancy is an area for future researchers to consider.

The Principal Leadership scale measured perceptions regarding how principals and assistant principals lead teachers in using data. Establishing structured time for the support of data driven decision making is an important component associated with this process. Descriptive results from Principal Leadership scale from teacher respondents indicated a relative weakness that leadership provides structured time for using data, protected time for professional development, and protected time for data conversations. As described by the conceptual framework, leadership is a critical driver throughout this process. Leadership has the capacity to establish structured time for data conversation, as well as, to define the nature of professional development opportunities for teachers. Understanding this information can be used by school leaders to establish the necessary

structured time and quality of professional development to support the use of data by teachers.

The computer data systems scale explored the technology systems for accessing and examining data. Results from the TDUS Teacher version indicated a relative weakness regarding the access to computer systems that maintain instructional assessment data. This organizational support is a critical component required for teachers to efficiently access information and use it in meaningful ways within their instructional practice. When data systems access is not wide spread or relatively easy to use, teachers are not likely to regularly use these systems. It is important for leadership at the school level and the diocesan level to establish computer systems that fully support the application of data within teacher practice.

Understanding the relationship between the four conceptual components and their underlying scales which are not a part of the Actions component may also provide important insight for consideration. Table 33 describes the significant positive correlations identified from the survey results. Significant positive correlations were found between the Data Competence scale and the Data's Effectiveness for Pedagogy scale, and the Principal Leadership scale.

Table 33

Significant Positive Scale Means Correlations

Group of Significant Positive Scale Means Correlations	
Data Competence	Principal Leadership
Data's Effectiveness for Pedagogy	Computer Data Systems
Principal Leadership	Collaborative Team Trust

Additionally, Significant positive correlations were found between the Principal Leadership scale and the Computer Data Systems scale and the Collaborative Team Trust scale.

These findings are significant because they demonstrate connections which can be made between scales. These connections can used to target improvements within school systems. For example, professional development can be created to support specific areas within the data competence scale, along with the data's effectiveness for pedagogy scale and the principal leadership scale.

Positive correlations were found between the Data Competence scale and the Actions with Data with Classroom Performance Assessment Data scale, Actions with the Interim (Benchmark) Assessment Data scale, and the Actions with School Developed Assessment Data scale. However, all three survey subgroups identified limited use of both the interim (benchmark) assessment data and school developed assessment data. This lack of significance identified by all three subgroups is actually quite significant. A comprehensive student assessment system includes the incorporation of information from annual, periodic, local and ongoing classroom assessments. The positive correlations identified between the Data Competence scale and the Actions with Data scale across each of the four assessment data categories is an area which future research can be explored. This study was not designed to explore why one set of Actions with Data scale was more widely accepted over another. Understanding the use of interim (benchmark) assessment data and school developed assessment data is an area of focus that the school leaders and diocesan leaders in this system can investigate and find new ways to support.

Relationship Between Results and Prior Research

This descriptive correlational study provided connections between the prior research reviewed and the current results. These connections have been explored within the context of the three primary questions investigated throughout this study.

Research question 1 examined the extent which teachers use data to support instructional decisions. Historically, the sources of assessment information were different than used today and instructional decisions were based on the tools of the teacher through intuition, teaching philosophy and experience (Mertler, 2014). As described previously in this study, recent history during the last two decades has witnessed a dramatic shift in the use of assessment information to support student learning (Mandinach, et. al, 2006). It is expected that today, teachers, administrators, and instructional support staff must be able to analyze a wide array of standardized assessment data, periodic data, local data, and classroom data to apply toward improved student outcomes (Dougherty, 2015; Lewis, 2019; Mertler, 2014). Significant advances in psychometrics and educational statistics joined by the advances witnessed in computer data systems, have led to an explosion of information for educators to process (Mertler, 2006).

The results of this study, however, demonstrate that significant gaps continue be present in this system of schools. Findings earlier reported demonstrated the variation of perceived usefulness and actual frequency of use between each of the four main assessment data forms, including the Iowa Assessment data, Interim (Benchmark) Assessment data, School Developed Assessment data, and Classroom Performance Assessment data. Results also indicated, and were confirmed between all three subgroups

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including teachers, administrators and instructional support staff, that classroom performance assessment data remains the most commonly used and is perceived to be the most useful. In this system of schools, teachers continue to rely on the older data tools of intuition, teaching philosophy and experience rather than employing a systematic approach. This suggests that this system of schools has significant distance to travel toward developing a highly systematic approach to data use within teachers' practice.

Research question 2 examined the extent to which specific components impacted teachers use of data to support instructional decisions. These surveyed conceptual components included teacher competence in using data, teacher attitudes toward data, teacher collaborative team trust, and organizational supports for teachers' data use. Prior research has identified essential data use practices required to improve instruction.

Research identified data use examples ranging from providing teachers, administrators, parents and students with snapshots of current performance toward a high-level usage to change instruction on an individual basis regularly (Dougherty, 2015; Sun et al., 2016). A synthesis of research conducted over a fourteen-year period by Sun, et al. (2016) identified effective data driven decision making practices which include the following actions: a.) connecting data to instruction; b.) using data to improve instruction; c.) data to plan and goal set; d.) data for assessing and monitoring progress; e.) combining formative and summative assessment data with interventions based in research and implemented with fidelity. Mertler (2014) identified the importance of reflection in order to plan effectively utilizing sophisticated data analysis tools by teachers.

The results of the current study identified relative weakness within teachers to plan and goal set for improved student learning by using assessment data analysis.

Additionally, teachers relied heavily on information gathered from one source, classroom performance assessment data, to plan future instruction. To move forward toward a systematic approach to data use incorporated into a data inquiry cycle for improved student-centered instructional design and practice, changes will need to be made within the system of schools and within individual schools. System leadership and school leadership will need to focus on building teacher capacity for data analysis, including the development of reflective practices. Additionally, leadership will need to build capacity to improve teacher self-efficacy regarding data use.

Research has supported the concept that teacher self-efficacy regarding their ability to use data effectively in the classroom lends to more successful data use by teachers to improve instruction (Dunlap & Piro, 2016). The results from this study seem to support prior research. Results identified positive correlations between the scale means of Data Competence, Data's Effectiveness for Pedagogy, and Principal Leadership. Positive correlations were also identified between the actions taken with data for Iowa Assessments and Classroom Performance Assessments and Data Competence.

Trust has been identified as an essential factor in the development of a culture of data use (Matters, 2006). Research has identified mistrust of student data by teachers as a reason for limiting data driven decision making (Mandinach, et al. 2006). Through appropriate professional development, systematic planning and leadership support, trust can be developed to support the development of a data culture. The results of this study demonstrated the interconnectedness between principal leadership, collaborative team trust and computer data systems. As described with the conceptual framework, leadership is the main driver to develop a school culture predicated on sociocultural learning theory.

Leadership impacts the development of modeling, collaboration, scaffolding and discourse to effect learning by teachers. Leadership also impacts the establishment and efficacy components of a data driven decision making system. These include communicating a clear data vision, providing a wealth of data tools, and creating structured time for data collaboration. Through these leadership actions, team trust is developed and a new culture of data use is established beyond the current practices.

A data culture cannot be created in a school without organizational support for data driven decision making. As current research has defined, a data culture includes data driven knowledge construction, collaboration, systematic use of data to inform instructional decisions, trust between stakeholders and sustainability (Sun et al., 2016). A common theme identified throughout research is the cyclic nature of data driven decision making (Mandinach & Jackson, 2012). The data inquiry cycle can be used by teachers to develop learning hypotheses, analyze student data, implement learning interventions and collect subsequent student data. This teacher driven practice can be supported as evidenced from the results of the current study with the improved capacity or data competence by establish strong leadership support. Some of the supports identified by the current study from leadership include the adoption of protected time for this process, providing regular and high-quality professional development for teachers in support of the process, and by supporting collaborative team trust.

A student-centered learning climate can have significant effects on student motivation and engagement (Byrck, 2010). The best use of data driven decision making leads toward a systematic, tailored instruction for each student. This process informs curricular design and identifies best practices that meets individual students at their most

pressing instructional need (Mandinach et al., 2006). A systematic instructional design includes a process of inquiry to establish updated and adjusted learning targets. Danielson (2007) identified a process of inquiry by which teachers instruct whole groups of students, adjust instruction to support smaller groups as defined by student data and culminates with highly specific individual instruction. This tailored approach, driven by teachers, is systematic, and provides opportunities for targeted student learning exactly where it is needed. To successfully integrate this complex framework of interactions, the systematic approach associated with data driven decision making is important to be highly established within the data culture of a school.

The results of this study indicate specific gaps related to this integration. The actions that teachers take with data, across all three subgroups, revealed that this process is not well-established utilizing each of the assessment data forms.

Research question 3 examined the perceptions of administrators and instructional support regarding teachers use of data to support instructional decisions. Current research highlights the significance of school system leadership, especially principal leadership in the formation of a successful data culture (Marsh & Farrell, 2015a; Piro, Dunlap, & Shutt, 2014; Piro & Hutchinson, 2014; Popkewitz, 1998; Vaughn & Faieta, 2017). Current research also identifies the significant relationship between the quantity and quality of professional development in data use to sustain a culture of data driven decision making (Darling-Hammond, 2009; Wei, 2009).

Sun, et al. (2016) identified three categories of leadership practices that promote data use. These categories include the provision of personal support by leadership to find

meaning within the data, technical support for teachers through protected, structured time, and the establishment of a collaborative data-wise culture.

The conceptual framework describes these connections through the role of leadership in establishing collaboration, modeling, scaffolding, and discourse. Within the scheme of data driven decision making, this is established through system leadership to establish a data vision and provide appropriate data tools. School leadership actively supports data collaboration, data literacy and the establishment of a data culture. This is accomplished through establishing structured time, and high-quality professional development which includes opportunities for collaborative actions with data.

The results established from this study validate current research regarding the importance of leadership, structured time for assessment data instructional practices, and professional development which supports this process of data driven decision making. Results of this study highlight correlations between data competence, data's effectiveness for pedagogy and principal leadership. As well, results also indicate the connections between principal leadership, computer data systems, and collaborative team trust. Fullan (2017) identifies six interconnected qualities associated with deep leadership. Table 34 compares these qualities with components of the conceptual framework to show this complexity and interconnectedness of leadership principals and data driven decision making.

Table 34

Comparison of Fullan's Qualities of Deep Leadership with the Leadership Driven Components of the Conceptual Framework

Deep Leadership Qualities	Sociocultural Theory	Data Driven Decision Making
Combining moral imperative and uplifting leadership.	Collaborative Learning and Discourse	Data Vision and Data Culture
Mastering content and process.	Scaffolding and Modeling	Data Tools and Data Literacy
Leading and Learning in equal measure.	Collaborative Learning	Data Collaboration
Seeing students as change experts.	Not applicable	Not Applicable
Feeding and being fed by the system.	Collaborative Learning and Modeling	Data Collaboration and Data Culture
Being essential and indispensable.	Modeling, Scaffolding, Collaborative Learning, and Discourse	Data Vision, Data Tools, Data Collaboration, Data Literacy, Data Culture

Limitations of the Study

This study possessed specific limitations which are explained herein. Current research is evolving regarding the subject of data driven decision making. The limited amount of quantitative research available for comparison hinders the application of the findings of this study. Additionally, the population included in this study included educational professionals from one system of schools in a Catholic Diocese in the Northeastern United States. As such, the findings may only be applied in that setting and are not generalizable across other geographic areas. Furthermore, the results may not necessarily be applied across other educational settings such as public-school systems or charter school systems.

A secondary limitation in this study included the response rate, in particular from the instructional support staff. The number of respondents available in this role was very small and the findings have been applied with that understanding. With a higher response rate from this subgroup, it is possible that specific findings may be changed. The low response rate from this subgroup was included in the results after considerable reflection. The study was conducted during the time period of the Covid-19 pandemic. The researcher included the responses received so as to give this important group of individuals a voice and to ensure that future research seek to better understand the connection to data driven decision making within this subgroup.

This study employed descriptive correlational design. In order to acquire richer information on the data use practices of teachers, a qualitative study is recommended to be performed to provide additional information to improve the understanding of the results.

This study included teachers, administrators, and instructional support staff from elementary schools only. This limitation does not provide any information regarding teacher data use practices in the high school setting, early childhood setting or post-secondary school setting.

Recommendations for Future Practice

The results of this study offer important considerations for future practice. However, the evolving field of research with data driven decision making suggests that all recommendations herein be considered in conjunction with the local educational community with which they may be applied.

In order to establish a systematic approach to data use, it is recommended that a system of schools adopts a well vetted Data Vision to share with all stakeholders. Secondly, systems must identify data analysis tools and ensure their open access and ease of use by all appropriate stakeholders. Teachers, instructional support staff and administrators will need to establish a common Data Literacy. This can be achieved through consistent professional development and collaborative discourse at all levels of the educational system. Finally, system leaders must establish protected and structured times for educators to incorporate all aspects of data driven decision making. With this outlined approach as described above, a systematic Data Culture can be established.

To build teacher capacity for data competence practices, it is recommended that systemic norms for the data inquiry cycle are created and supported through professional development and the purposeful use of protected time for professional development, and student-centered instructional design and practice development. Specifically, it is recommended that administrators, instructional support staff, and teachers focus on improving their skills to use all four assessment data forms to improve their ability to plan and goal set for individual students.

Teachers' self-efficacy or data competence is a meaningful indicator of effective data use practices. School leadership is recommended to infuse Sociocultural learning theory components, including modeling, scaffolding, collaborative learning and discourse within their school leadership practices. Professional development can be targeted at developing leadership capacity in these components. Additionally, professional development can be targeted at supporting the use of computer data systems and improving collaborative team trust.

Achieving a systematic, data driven, student centered instructional design and practice to maximize student learning is steeped in Fullan's deeper leadership practice which combines creating moral imperative and uplifting leadership. The results of this study suggest that schools may support teacher development towards their use of the data inquiry cycle. As much, schools need to provide structured professional development and leadership support for the creation of student-centered design and instructional practices. These include the improved use of data to inform instructional planning and goal setting.

Recommendations for Future Research

The results of this study have led this researcher to identify questions which must be explored in order to better understand the data use practices of teachers, administrators and instructional support staff. This section seeks to guide future researchers based on the findings and implications from the current study. The recommendations identified below are indicative of the most pressing areas for exploration as a result of conducting this current study.

Since the study of data driven decision making is an evolving field, it is recommended that future research consider incorporating the administration of the Teacher Data Use Survey. Future research can expand the understanding of teacher practices with assessment data through analysis of selected demographic groups such as years of educational experience, classroom size or school size, middle school or high school grade level teachers, public school or charter school communities, and urban suburban, or rural settings.

One recommendation for future study is to explore the relationship between assessment data use, structured time available for data use practices, and the professional

development resources available to teachers to support assessment data use. The lack of structured time for teachers to access and use assessment data and the lack of quantity and quality of professional development resources was an important theme identified during this study.

Another recommendation for future study is to explore why the annual assessment data category is the most widely known but least used within teacher practice. A secondary question within this study would likely explore how annual assessment data can be better incorporated into teacher practice, including for planning purposes, goal setting, student conversations and parent conversations.

Building capacity for a student-centered instructional design and practice is an important focus in schools today. Future research is recommended to explore the extent to which assessment data is connected to lesson planning and individual student goal setting. This may be enhanced by additional exploration into the relationship between different data use scales. Specifically, a study could explore the connectedness of data competence, data's effectiveness for pedagogy, and principal leadership. Another recommendation includes an exploration into the relationship of principal leadership, computer data systems, and collaborative team trust.

A final recommendation for further study includes an investigation into the relationship between actions teachers take with both interim assessment data and school developed assessment data and teachers' perceptions of data competence.

Conclusion

Research has highlighted the complexity of applying data driven decision making in a systematic way for the advancement of student learning. Student data and the tools available to access and analyze data have created an explosion of information which teachers, instructional support staff and administrators are fully expected to be able to utilize in meaningful, student-centered ways. The skill sets required to lead schools has evolved to incorporate methods and practices significantly more complicated than merely acting as school managers. The skill set required of teachers to incorporate large amounts of student data in a meaningful way to impact whole classrooms, small groups of students and individual students for planning, goal setting, and communicating student learning needs has also evolved over the last two decades.

This study has demonstrated a connection between a sociocultural learning model and the process of data driven decision making. It has also highlighted the importance of leadership, in particular school principals as drivers of these process. Additionally, this study has explored teacher data use actions and has identified important connections between teachers, the data inquiry cycle and the development of a student-centered instructional design and practice.

Teacher self-efficacy in data competence is a central component indicated within a successful data driven decision making approach. Trust between colleagues and school leaders is an important component of data competence. A collaborative environment is essential to the development of trust between colleagues and leadership. Professional development of high quality and regular quantity targeted at the improvement of practice is an essential component of developing and fostering collaborative data use practices.

Finally, protected, structured time for all of the above is the essential link that may bind a strong Data Culture together.

APPENDIX A: SIGNED IRB INSTITUTION APPROVAL

DIOCESE OF ██████████████ DEPARTMENT OF EDUCATION
128 Cherry Lane, ██████ ██████████

Office of the
Superintendent

June 3, 2020

Attn: St. Johns Institutional Review Board

I have reviewed Michael Connell's approved IRB research protocol, including letters of consent, titled "An Examination of the Perceptions of Teachers, Administrators, and Instructional Support Staff About the Use of Data to Guide Instruction in a Catholic Diocese, in the Northeastern United States." I understand what he is asking of the individuals and grant him permission to conduct his study at the Diocese of ██████████ elementary schools. I have the authority to do so.

If I have any further questions about this research study, I also understand that Michael Connell may be contacted at (631) 566-7906, Michael.connell17@mystjohns.edu, St. John's University School of Education, Department of Administrative and Instructional Leadership (DAIL), 8000 Utopia Parkway, Queens, NY 11439 or the faculty sponsor, Dr. Rosalba Del Vecchio, at (718) 990-5277, delveccr@stjohns.edu, St. John's University School of Education, Department of Administrative and Instructional Leadership (DAIL), 8000 Utopia Parkway, Queens, NY 11439.

I also understand that if I have any questions regarding this IRB approval or the rights of research participants, I can contact Raymond DiGiuseppe, Ph.D., Chair, St. John's Institutional Review Board, at (718) 990 -1440 or via e-mail at digiuser@stjohns.edu.

Thank you.

Sincerely,

Dr. Kathleen Walsh

Dr. Kathleen Walsh
Superintendent of Schools
Department of Education
Diocese of ██████████
128 Cherry Lane

██████████
██████████

SIGNATURE *Dr. Kathleen Walsh*   Date: 6/3/2020

APPENDIX B: TEACHER DATA USE SURVEY (TEACHER EDITION)

Demographic Data:

The following questions identify demographic information which will be used to further analyze the results of this survey.

How many years have you been teaching?

0 – 4 Years   5 – 9 years   10 – 14 years   15 – 19 years   20 or more years

What is the highest level of university degree that you have earned?

Bachelor's Degree   Master's Degree   EdD or PhD

What grade level do you teach?

Early Childhood   (PK – K)   Childhood 1 – 6   Middle school 7 – 8

What is your current or typical class size?

10 or fewer students   11 – 19 students   20 – 29 students   30 students or greater

The following questions ask about various forms of data that teachers use in their work.

1. Are the following forms of data available to you?

Form of data	Yes	No
Iowa Assessment Data		
Interim (Benchmark) Assessment Data		
School Developed Assessment Data		
Classroom Performance Data		
Other		

If you indicated "No" to all options in question 1, skip to question 10. If you responded "Yes" to any option, please proceed to question 2.

2. Teachers use all kinds of information (i.e., data) to help plan for instruction that meets student learning needs. How <u>frequently </u>do you use the following forms of data?

Form of data	Do not use	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
Iowa Assessment Data					
Interim (Benchmark) Assessment Data					
School Developed Assessment Data					
Classroom Performance Data					
Other					

3. If you marked the "other" option, please specify the form of data here:

_____

_____

_____

4. Now, how <u>useful</u> are the following forms of data to <u>your</u> practice?

Form of data	Not useful	Somewhat useful	Useful	Very Useful
Iowa Assessment Data				
Interim (Benchmark) Assessment Data				
School Developed Assessment Data				
Classroom Performance Data				
Other				

5. If you marked the "other" option, please specify the form of data here:

_____
_____
_____

If you indicated that Iowa Assessment Data is not available to you in question 1, OR if indicated that you do not use Iowa Assessment Data in question 2, please go to question 7.

6. These questions ask about Iowa Assessment Data. In a typical <u>school year</u>, how often do you do the following?

Action	One or two times a year	A few times a year	Monthly	Weekly
a. Use Iowa Assessment Data to identify instructional content to use in class.				
b. Use Iowa Assessment Data to tailor instruction to individual students' needs				
c. Use Iowa Assessment Data to develop recommendations for additional instructional support.				
d. Use Iowa Assessment Data to form small groups of students for targeted instruction.				
e. Discuss Iowa Assessment Data with a parent or guardian.				
f. Discuss Iowa Assessment Data with a student.				

Action					

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
g. Meet with a specialist (e.g., instructional coach or data coach) about Iowa Assessment Data.				
h. Meet with another teacher about Iowa Assessment Data.				

If you indicated that Interim (benchmark) assessment data is "not available" to you in question 1, OR if you indicated that you ""do not use" interim (benchmark) assessment data in question 2, please go to question 8.

7. These questions ask about Interim (benchmark) assessment data used in your school. In a typical <u>month</u>, how often do you do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use interim (benchmark) assessment data to identify instructional content to use in class.				
b. Use interim (benchmark) assessment data to tailor instruction to individual students' needs.				
c. Use interim (benchmark) assessment data to develop recommendations for additional instructional support.				
d. Use interim (benchmark)				

assessment data to form small groups of students for targeted instruction.	
e. Discuss interim (benchmark) assessment data with a parent or a guardian.	
f. Discuss interim (benchmark) assessment data with a student.	
g. Meet with a specialist (e.g., instructional coach or data coach) about interim (benchmark) assessment data.	
h. Meet with another teacher about interim (benchmark) assessment data.	

If you indicated that school assessment card data is "not available" to you in question 1, OR if you indicated that you "do not use" school assessment card data in question 2, please go to question 9.

8. These questions ask about school assessment data developed and used in your school. In a typical <u>month</u>, how often do you do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use school developed assessment data to identify instructional content to use in class.				

b.	Use school developed assessment data to tailor instruction to individual students' needs.
c.	Use school developed assessment data to develop recommendations for additional instructional support.
d.	Use school developed assessment data to form small groups of students for targeted instruction.
e.	Discuss school developed assessment data with a parent or guardian.
f.	Discuss school developed assessment data with a student.
g.	Meet with a specialist (e.g., instructional coach or data coach) about school developed assessment data.
h.	Meet with another teacher about school developed assessment data.

If you indicated that <personal data> is "not available" to you in question 1, OR if you indicated that you "do not use" <personal data> in question 2, please go to question 10.

9. These questions ask about <personal data>. In a typical month, how often do you do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use classroom performance data to identify instructional content to use in class.				
b. Use classroom performance data to tailor instruction to individual students' needs.				
c. Use classroom performance data to develop recommendations for additional instructional support.				
d. Use classroom performance data to form small groups of students for targeted instruction.				
e. Discuss classroom performance data with a parent or guardian.				
f. Discuss classroom performance data with a student.				

Statement				

	Strongly disagree	Disagree	Agree	Strongly agree
g. Meet with a specialist (e.g. instructional coach or data coach) about classroom performance data.				
h. Meet with another teacher about classroom performance data.				

The remainder of this survey asks general questions about the use of data to inform your education practice. For the rest of this survey, please consider only the following when you are asked about "data":

- *Iowa assessments.*
- *Interim (benchmark) assessments.*
- *School developed assessments.*

10. These questions ask about supports for using data. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree
a. I am adequately supported in the effective use of data.				
b. I am adequately prepared to use data.				
c. There is someone who answers my about using data.				
d. There is someone who helps				

Statement			
me change my practice (e.g., my teaching) based on data.			
e. My department of education provides enough professional development about data use.			
f. My department of education's professional development is useful for learning about data use.			

11. These questions ask about <u>your</u> attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree
a. Data helps teachers plan instruction.				
b. Data offer information about students that was not already known.				
c. Data help teachers know what concepts				

	Strongly disagree	Disagree	Agree	Strongly agree
students are learning.				
d. Data help teachers identify learning goals for students.				
e. Students benefit when teacher instruction is informed by data.				
f. I think it is important to use data to inform education practice.				
g. I like to use data.				
h. I find data useful.				
i. Using data helps me be a better teacher.				

12. These questions ask how your principal and assistant principal(s) support you in using data. Principals and assistant principals will not be able to see your answers. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree
a. My principal or assistant principal(s) encourages data use as a tool to support effective teaching.				

Statements			
b. My principal or assistant principal(s) creates many opportunities for teachers to use data.			
c. My principal or assistant principal(s) has made sure teachers have plenty of training for data use.			
d. My principal or assistant principal(s) is a good example of an effective data user.			
e. My principal or assistant principal(s) discusses data with me.			
f. My principal or assistant principal(s) creates protected time for using data.			

13. Your school or department of education gives you programs, systems, and other technology to help you access and use student data. The following questions ask about these computer systems. Please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
a. I have the proper technology to				

	efficiently examine data.			
b.	The computer systems in my district provide me access to lots of data.			
c.	The computer systems (for data use) in my district are easy to use.			
d.	The computer systems in my district allow me to examine various types of data at once (e.g., attendance, achievement, demographics).			
e.	The computer systems in my district generate displays (e.g., reports, graphs, tables) that are useful to me.			

14. These questions ask about your attitudes toward your own use of data. Please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
a. I am good at using data to diagnose student learning needs.				
b. I am good at adjusting				

	instruction based on data.
c. I am good at using data to plan lessons.	
d. I am good at using data to set student learning goals.	

The following questions ask about your work in collaborative teams.

15. How often do you have scheduled meetings to work in collaborative team(s)? (Check only one.)

	Less than once per month.
	Once or twice a month.
	Weekly or almost weekly.
	A few times a week.
	I do not have scheduled meetings to work in collaborative teams.

If you answered "I do not have scheduled meetings to work in collaborative teams" in question 15, please go to question 18.

16. As you think about your collaborative team(s), please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
a. Members of my team trust one another.				
b. It's ok to discuss feelings and worries with other members of my team.				

Statements			
c. Members of my team respect colleagues who lead school improvement efforts.			
d. Members of my team respect those colleagues who are experts in their craft.			
e. My principal or assistant principal(s) fosters a trusting environment for discussing data in teams.			

17. How often do you and your collaborative team(s) do the following?

Statements	Never	Sometimes	Often	A lot
a. We approach an issue by looking at data.				
b. We discuss our preconceived beliefs about an issue.				
c. We identify questions that we will seek to answer using data.				
d. We explore data by				

	looking for patterns and trends.	
e.	We draw conclusions based on data.	
f.	We identify additional data to offer a clearer picture of the issue.	
g.	We use data to make links between instruction and student outcomes.	
h.	When we consider changes in practice, we predict possible student outcomes.	
i.	We revisit predictions made in previous meetings.	
j.	We identify actionable solutions based on or conclusions.	

18. What else would you like to share with us about data use?

APPENDIX C: TEACHER DATA USE SURVEY (ADMINISTRATOR EDITION)

Demographic Data:

The following questions identify demographic information which will be used to further analyze the results of this survey.

How many years have you been a principal or assistant principal?

0 – 4 Years   5 – 9 years   10 – 14 years   15 – 19 years   20 or more years

What is your current school enrollment in grades PK - 8?

150 or fewer students 151 – 300 students   301 – 450 students   451 students or greater

The following questions ask about various forms of data that teachers may use in their work.

1. Are the following forms of data <u>available</u> to your teachers?

Form of data	Yes	No
Iowa Assessment Data		
Interim (Benchmark) Assessment Data		
School Developed Assessment Data		
Classroom Performance Data		
Other		

If you indicated "No" to all options in question 1, skip to question 10. If you responded "Yes" to any option, please proceed to question 2.

2. Teachers use all kinds of information (i.e., data) to help plan for instruction that meets student learning needs. How <u>frequently </u>do your teachers use the following forms of data?

Form of data	Do not use	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
Iowa Assessment Data					

Interim (Benchmark) Assessment Data				
School Developed Assessment Data				
Classroom Performance Data				
Other				

3. If you marked the "other" option, please specify the form of data here:

_____

_____

_____

4. Now, how <u>useful</u> are the following forms of data to <u>teacher</u> practice?

Form of data	Not useful	Somewhat useful	Useful	Very Useful
Iowa Assessment Data				
Interim (Benchmark) Assessment Data				
School Developed Assessment Data				
Classroom Performance Data				
Other				

5. If you marked the "other" option, please specify the form of data here:

_____

_____

_____

If you indicated that Iowa Assessment Data is not available to your teachers in question 1, OR if indicated that your teachers do not use Iowa Assessment Data in question 2, please go to question 7.

6. These questions ask about Iowa Assessment Data. In a typical <u>school year</u>, how often do your teachers do the following?

Action	One or two times a year	A few times a year	Monthly	Weekly
i. Use Iowa Assessment Data to identify instructional content to use in class.				
j. Use Iowa Assessment Data to tailor instruction to individual students' needs				
k. Use Iowa Assessment Data to develop recommendations for additional instructional support.				
l. Use Iowa Assessment Data to form small groups of students for targeted instruction.				
m. Discuss Iowa Assessment Data with a parent or guardian.				
n. Discuss Iowa Assessment Data with a student.				
o. Meet with a specialist (e.g., instructional coach or data coach) about Iowa Assessment Data.				

Action					
p.	Meet with another teacher about Iowa Assessment Data.				

If you indicated that Interim (benchmark) assessment data is "not available" to your teachers in question 1, OR if you indicated that your teachers ""do not use" interim (benchmark) assessment data in question 2, please go to question 8.

7. These questions ask about Interim (benchmark) assessment data used in your school. In a typical <u>month</u>, how often do your teachers do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
i. Use interim (benchmark) assessment data to identify instructional content to use in class.				
j. Use interim (benchmark) assessment data to tailor instruction to individual students' needs.				
k. Use interim (benchmark) assessment data to develop recommendations for additional instructional support.				
l. Use interim (benchmark) assessment data to form small groups of students for targeted instruction.				

Action				
m. Discuss interim (benchmark) assessment data with a parent or a guardian.				
n. Discuss interim (benchmark) assessment data with a student.				
o. Meet with a specialist (e.g., instructional coach or data coach) about interim (benchmark) assessment data.				
p. Meet with another teacher about interim (benchmark) assessment data.				

If you indicated that school developed assessment data is "not available" to your teachers in question 1, OR if you indicated that your teachers "do not use" school developed assessment data in question 2, please go to question 9.

8. These questions ask about school assessment data developed and used in your school. In a typical <u>month</u>, how often do your teachers do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
i. Use school developed assessment data to identify instructional content to use in class.				
j. Use school developed assessment data to tailor instruction to				

individual students' needs.	
k. Use school developed assessment data to develop recommendations for additional instructional support.	
l. Use school developed assessment data to form small groups of students for targeted instruction.	
m. Discuss school developed assessment data with a parent or guardian.	
n. Discuss school developed assessment data with a student.	
o. Meet with a specialist (e.g., instructional coach or data coach) about school developed assessment data.	
p. Meet with another teacher about school developed assessment data.	

If you indicated that classroom performance data is "not available" to your teachers in question 1, OR if you indicated that your teachers "do not use" classroom performance data in question 2, please go to question 10.

9. These questions ask about classroom performance data. In a typical month, how often do your teachers do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
i. Use classroom performance data to identify instructional content to use in class.				
j. Use classroom performance data to tailor instruction to individual students' needs.				
k. Use classroom performance data to develop recommendations for additional instructional support.				
l. Use classroom performance data to form small groups of students for targeted instruction.				
m. Discuss classroom performance data with a parent or guardian.				
n. Discuss classroom performance data with a student.				
o. Meet with a specialist (e.g. instructional coach or data coach) about classroom				

performance data.				
p. Meet with another teacher about classroom performance data.				

The remainder of this survey asks general questions about the use of data to inform your education practice. For the rest of this survey, please consider only the following when you are asked about "data":

- *Iowa assessments.*
- *Interim (benchmark) assessments.*
- *School developed assessments.*

10. These questions ask about supports for using data. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree
g. My teachers are adequately supported in the effective use of data.				
h. My teachers are adequately prepared to use data.				
i. There is someone who answers my teachers' questions about using data.				
j. There is someone who helps my teachers change their				

Statement		Strongly disagree	Disagree	Agree	Strongly agree
	practice (e.g., their teaching) based on data.				
k.	My department of education provides my teachers enough professional development about data use.				
l.	My department of education's professional development for my teachers is useful for learning about data use.				

11. These questions ask about <u>your</u> attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements:

Statement		Strongly disagree	Disagree	Agree	Strongly agree
j.	Data helps teachers plan instruction.				
k.	Data offer information about students that was not already known.				

l.	Data help teachers know what concepts students are learning.				
m.	Data help teachers identify learning goals for students.				
n.	Students benefit when teacher instruction is informed by data.				
o.	I think it is important to use data to inform education practice.				
p.	I like to use data.				
q.	I find data useful.				
r.	Using data helps me be a better teacher.				

12. These questions ask about teacher supports for using data. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree
g. I encourage data use as a tool to support effective teaching.				

Statements				
h. I create many opportunities for teachers to use data.				
i. I have made sure teachers have plenty of training for data use.				
j. I am a good example of an effective data user.				
k. I discuss data with my teachers.				
l. I create protected time for using data.				

13. Your school or department of education gives you programs, systems, and other technology to help you access and use student data. The following questions ask about these computer systems. Please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
f. I have the proper technology to efficiently examine data.				
g. The computer systems in my district provide me access to lots of data.				
h. The computer systems (for data use) in the diocese are easy to use.				
i. The computer systems in my				

Statements	Strongly disagree	Disagree	Agree	Strongly agree
diocese allow me to examine various types of data at once (e.g., attendance, achievement, demographics).				
j. The computer systems in my diocese generate displays (e.g., reports, graphs, tables) that are useful to me.				

14. These questions ask about your attitudes toward <u>your teachers'</u> use of data. Please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
e. My teachers are good at using data to diagnose student learning needs.				
f. My teachers are good at adjusting instruction based on data.				
g. My teachers are good at using data to plan lessons.				

Statements	Strongly disagree	Disagree	Agree	Strongly agree
h. My teachers are good at using data to set student learning goals.				

The following questions ask about your work in collaborative teams.

15. How often do you have scheduled meetings to work in collaborative team(s) with your teachers? (Check only one.)

	Less than once per month.
	Once or twice a month.
	Weekly or almost weekly.
	A few times a week.
	I do not have scheduled meetings to work in collaborative teams.

If you answered "I do not have scheduled meetings to work in collaborative teams" in question 15, please go to question 18.

16. As you think about your collaborative team(s), please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
f. Members of my team trust one another.				
g. It's ok to discuss feelings and worries with other members of my team.				
h. Members of my team respect colleagues who lead school				

Statements			
improvement efforts.			
i. Members of my team respect those colleagues who are experts in their craft.			
j. As an administrator, I foster a trusting environment for discussing data in teams.			

17. How often do you and your collaborative team(s) do the following?

Statements	Never	Sometimes	Often	A lot
k. We approach an issue by looking at data.				
l. We discuss our preconceived beliefs about an issue.				
m. We identify questions that we will seek to answer using data.				
n. We explore data by looking for patterns and trends.				
o. We draw conclusions based on data.				
p. We identify additional				

	data to offer a clearer picture of the issue.
q.	We use data to make links between instruction and student outcomes.
r.	When we consider changes in practice, we predict possible student outcomes.
s.	We revisit predictions made in previous meetings.
t.	We identify actionable solutions based on or conclusions.

18. What else would you like to share with us about data use?

APPENDIX D: TEACHER DATA USE SURVEY (INSTRUCTIONAL SUPPORT STAFF EDITION)

Demographic Data:

The following questions identify demographic information which will be used to further analyze the results of this survey.

How many years have you been an instructional support staff member?

0 – 4 Years   5 – 9 years   10 – 14 years   15 – 19 years   20 or more years

What is your current school enrollment in grades PK - 8?

150 or fewer students 151 – 300 students   301 – 450 students   451 students or greater

What grade level group do you primarily provide instructional support?

Early childhood (PK – K)   Childhood (1 – 6)   Middle school (7 – 8)

The following questions ask about various forms of data that teachers may use in their work.

1. Are the following forms of data <u>available</u> to the teachers you support?

Form of data	Yes	No
Iowa Assessment Data		
Interim (Benchmark) Assessment Data		
School Developed Assessment Data		
Classroom Performance Data		
Other		

If you indicated "No" to all options in question 1, skip to question 10. If you responded "Yes" to any option, please proceed to question 2.

2. Teachers use all kinds of information (i.e., data) to help plan for instruction that meets student learning needs. How frequently do the teachers you support use the following forms of data?

Form of data	Do not use	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
Iowa Assessment Data					
Interim (Benchmark) Assessment Data					
School Developed Assessment Data					
Classroom Performance Data					
Other					

3. If you marked the "other" option, please specify the form of data here:

_____

_____

_____

4. Now, how <u>useful</u> are the following forms of data to <u>teacher</u> practice?

Form of data	Not useful	Somewhat useful	Useful	Very Useful
Iowa Assessment Data				
Interim (Benchmark) Assessment Data				
School Developed Assessment Data				
Classroom Performance Data				
Other				

5. If you marked the "other" option, please specify the form of data here:

_____

_____

_____

If you indicated that Iowa Assessment Data is not available to your teachers in question 1, OR if indicated that your teachers do not use Iowa Assessment Data in question 2, please go to question 7.

6. These questions ask about Iowa Assessment Data. In a typical <u>school year</u>, how often do the teachers you support do the following?

Action	One or two times a year	A few times a year	Monthly	Weekly
q. Use Iowa Assessment Data to identify instructional content to use in class.				
r. Use Iowa Assessment Data to tailor instruction to individual students' needs				
s. Use Iowa Assessment Data to develop recommendations for additional instructional support.				
t. Use Iowa Assessment Data to form small groups of students for targeted instruction.				
u. Discuss Iowa Assessment Data with a parent or guardian.				
v. Discuss Iowa Assessment Data with a student.				

Action				
w. Meet with a specialist (e.g., instructional coach or data coach) about Iowa Assessment Data.				
x. Meet with another teacher about Iowa Assessment Data.				

If you indicated that Interim (benchmark) assessment data is "not available" to your teachers in question 1, OR if you indicated that your teachers ""do not use" interim (benchmark) assessment data in question 2, please go to question 8.

7. These questions ask about Interim (benchmark) assessment data used in your school. In a typical <u>month</u>, how often do the teachers you support do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
q. Use interim (benchmark) assessment data to identify instructional content to use in class.				
r. Use interim (benchmark) assessment data to tailor instruction to individual students' needs.				
s. Use interim (benchmark) assessment data to develop recommendations for additional instructional support.				

t. Use interim (benchmark) assessment data to form small groups of students for targeted instruction.			
u. Discuss interim (benchmark) assessment data with a parent or a guardian.			
v. Discuss interim (benchmark) assessment data with a student.			
w. Meet with a specialist (e.g., instructional coach or data coach) about interim (benchmark) assessment data.			
x. Meet with another teacher about interim (benchmark) assessment data.			

If you indicated that school developed assessment data is "not available" to your teachers in question 1, OR if you indicated that your teachers "do not use" school developed assessment data in question 2, please go to question 9.

8. These questions ask about school assessment data developed and used in your school. In a typical <u>month</u>, how often do the teachers you support do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
q. Use school developed assessment data to identify				

	instructional content to use in class.
r.	Use school developed assessment data to tailor instruction to individual students' needs.
s.	Use school developed assessment data to develop recommendations for additional instructional support.
t.	Use school developed assessment data to form small groups of students for targeted instruction.
u.	Discuss school developed assessment data with a parent or guardian.
v.	Discuss school developed assessment data with a student.
w.	Meet with a specialist (e.g., instructional coach or data coach) about school developed assessment data.
x.	Meet with another teacher about school

	developed
	assessment data.

If you indicated that classroom performance data is "not available" to your teachers in question 1, OR if you indicated that your teachers "do not use" classroom performance data in question 2, please go to question 10.

9. These questions ask about classroom performance data. In a typical month, how often do the teachers you support do the following?

Action	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
q. Use classroom performance data to identify instructional content to use in class.				
r. Use classroom performance data to tailor instruction to individual students' needs.				
s. Use classroom performance data to develop recommendations for additional instructional support.				
t. Use classroom performance data to form small groups of students for targeted instruction.				
u. Discuss classroom performance data with a parent or guardian.				

Statement			
v. Discuss classroom performance data with a student.			
w. Meet with a specialist (e.g. instructional coach or data coach) about classroom performance data.			
x. Meet with another teacher about classroom performance data.			

The remainder of this survey asks general questions about the use of data to inform your education practice. For the rest of this survey, please consider only the following when you are asked about "data":

- *Iowa assessments.*
- *Interim (benchmark) assessments.*
- *School developed assessments.*

10. These questions ask about supports for using data. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree
m. My teachers are adequately supported in the effective use of data.				
n. My teachers are adequately prepared to use data.				
o. There is someone				

	who answers my teachers' questions about using data.	
p.	There is someone who helps my teachers change their practice (e.g., their teaching) based on data.	
q.	My department of education provides my teachers enough professional development about data use.	
r.	My department of education's professional development for my teachers is useful for learning about data use.	

11. These questions ask about <u>your</u> attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree

s.	Data helps teachers plan instruction.
t.	Data offer information about students that was not already known.
u.	Data help teachers know what concepts students are learning.
v.	Data help teachers identify learning goals for students.
w.	Students benefit when teacher instruction is informed by data.
x.	I think it is important to use data to inform education practice.
y.	I like to use data.
z.	I find data useful.
aa.	Using data helps me be a better teacher.

12. These questions ask how your principal and assistant principal(s) support your teachers in using data. Please indicate how much you agree or disagree with the following statements:

Statement	Strongly disagree	Disagree	Agree	Strongly agree
m. My principal or assistant principal(s) encourages data use as a tool to support effective teaching.				
n. My principal or assistant principal(s) creates many opportunities for teachers to use data.				
o. My principal or assistant principal(s) has made sure teachers have plenty of training for data use.				
p. My principal or assistant principal(s) is a good example of an effective data user.				
q. My principal or assistant principal(s) discuss data with my teachers.				
r. My principal or assistant principal(s) creates				

	Statements	Strongly disagree	Disagree	Agree	Strongly agree
	protected time for using data.				

13. Your school or department of education gives you programs, systems, and other technology to help you access and use student data. The following questions ask about these computer systems. Please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
k. I have the proper technology to efficiently examine data.				
l. The computer systems in my district provide me access to lots of data.				
m. The computer systems (for data use) in the diocese are easy to use.				
n. The computer systems in my diocese allow me to examine various types of data at once (e.g., attendance, achievement, demographics).				
o. The computer systems in my diocese generate displays (e.g., reports, graphs, tables) that are useful to me.				

14. These questions ask about your attitudes toward <u>your teachers'</u> use of data. Please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
i. My teachers are good at using data to diagnose student learning needs.				
j. My teachers are good at adjusting instruction based on data.				
k. My teachers are good at using data to plan lessons.				
l. My teachers are good at using data to set student learning goals.				

The following questions ask about your work in collaborative teams.

15. How often do you have scheduled meetings to work in collaborative team(s) with your teachers? (Check only one.)

	Less than once per month.
	Once or twice a month.
	Weekly or almost weekly.

	A few times a week.
	I do not have scheduled meetings to work in collaborative teams.

If you answered "I do not have scheduled meetings to work in collaborative teams" in question 15, please go to question 18.

16. As you think about your <u>collaborative team(s)</u>, please indicate how much you agree or disagree with the following statements:

Statements	Strongly disagree	Disagree	Agree	Strongly agree
k. Members of my team trust one another.				
l. It's ok to discuss feelings and worries with other members of my team.				
m. Members of my team respect colleagues who lead school improvement efforts.				
n. Members of my team respect those colleagues who are experts in their craft.				
o. My principal or assistant principal(s) fosters a trusting environment for discussing data in teams.				

17. How often do you and your collaborative team(s) do the following?

Statements	Never	Sometimes	Often	A lot
u. We approach an issue by looking at data.				
v. We discuss our preconceived beliefs about an issue.				
w. We identify questions that we will seek to answer using data.				
x. We explore data by looking for patterns and trends.				
y. We draw conclusions based on data.				
z. We identify additional data to offer a clearer picture of the issue.				
aa. We use data to make links between instruction and student outcomes.				
bb. When we consider changes in practice, we predict				

	possible student outcomes.
cc.	We revisit predictions made in previous meetings.
dd.	We identify actionable solutions based on or conclusions.

18. What else would you like to share with us about data use?

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