EXPLORING NOVICE TEACHERS’ PERCEPTIONS OF DATA-DRIVEN DECISION MAKING:

A CASE STUDY

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by

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ABSTRACT

With the passing of No Child Left Behind (2001), data from statewide tests are now being used to shape curriculum, evaluate teacher effectiveness, and determine the success of individual schools. Consequently, data analysis and data-driven decision making have become common terms in the educational world. Teachers are now required to utilize the data to drive their instructional practice to best meet the needs of individual students. However, little research has explored the factors that influence novice teachers’ data-driven decision making.

This qualitative study explored novice teachers’ perceptions regarding data-driven decision making through an in-depth case study of four novice teachers, each teaching in a different elementary school, in a rural Pennsylvania district. Specifically, this study examined how factors, such as training and social influences, impacted novices’ data use.

Data collection occurred over a six-month period and included in-depth conversations with novice teachers and the district’s Director of Elementary Education. Additionally, relevant documents were collected and analyzed. Extensive data analysis was accomplished through thematic coding based upon the research questions and Ajzen’s theory of planned behavior (1991). The research resulted in a rich description of the factors that novice teachers perceived to have influenced their data-driven decision making.

Four broad conclusions can be drawn from this study. First, training is imperative for data use. The novices’ lack of pre-service and in-service professional development regarding assessments and data use negatively impacted their decision to engage in data-driven decision making. Second, novices perceived incongruity between the assessment data and their instruction. Thus, the teachers in this study perceived the assessment data as invalid; consequently, they relied heavily on their personal observations rather than the data when
making instructional decisions. Third, the underlying culture of the schools significantly impacted novice teachers’ perceptions regarding data-driven decision making. While on the surface it appeared that the novices experienced pressure from the district administration and the state to use data, in reality the beliefs and values exemplified by their colleagues deterred them from whole-heartedly embracing data use. Fourth, principal leadership is crucial for meaningful data use. The principal leadership in this study’s schools influenced the teachers’ beliefs regarding data and how the data were used. Recommendations for future practice and research were also provided.
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Chapter 1

Introduction

Interpretive Autobiography

As I graduated college with my teaching degree, I felt confident in my abilities and preparation; I had a good understanding of educational theory and could plan engaging lessons. My teacher preparation program had presented assessment as a way to determine students’ understanding and to guide future instruction. Assessment was organized by each individual teacher to serve his or her purposes in the confines of his or her classroom. However, as I began my first year of teaching in the public school system, I quickly realized that education was undergoing a significant transformation. In light of No Child Left Behind (NCLB), standardized testing and data had become the focus of the school system. During my first years, I was required to implement the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), the 4-Sight Test, and the PSSA assessment. Not only was I expected to administer these assessments, but I was to use the resulting data to base all of my instructional decisions. While I was very minimally trained on administering the tests, I received no training on how to analyze the data and use it effectively.

I would sit at my desk at the end of the day looking helplessly at the piles of neatly organized and color-coded graphs and computer-generated reports. Andrew did not reach the benchmark goal for oral reading fluency and the report stated that he was “strategic”. Ashley met the oral reading goal, but did not make the goal for retell fluency. Todd was identified as needing “intensive” support. Mary was below basic in Numbers and Operations, but proficient in the Geometry category. On and on it went, with each chart and table providing an overwhelming amount of information. Each assessment had its own terms, goals, and
foundational theory. Akin to peeling an onion, each assessment had layers of data. While each assessment gave a broad overview interpretation, the layers could be peeled away to look at the various probes and even further to look at each item and miscue. For example, the DIBELS assessment generates a composite score for each child. However, consideration needs to be given to each of the individual probes, as the composite score can be compromised of as many as five different probes. The results of each probe can be scrutinized through a miscue analysis to identify specific patterns of errors. As a novice teacher, already overwhelmed by lesson planning, grade recording, meeting the needs of the students in my class, and integrating myself into a new faculty, data analysis was a daunting task. For one child, the data from all of the assessments could take hours to analyze.

Once the data were analyzed, the consequent instructional steps were not well-defined. For example, the DIBELS data showed that Andrew was not a fluent reader. After months of working closely with him, I already knew that Andrew was not a fast reader. The question still remained: how can this data allow me to help him? The answer was to administer more assessments. The results of the original three-minute assessment led to administering informal assessments, such as the Quick Phonics Screener, the Phonological Awareness Screener, and running records to uncover specific weaknesses. The data pile continued to grow, quickly burying me underneath.

Looking for help, I returned to graduate school for my Reading Specialist certification. However, other than a knee-jerk, negative reaction to any form of standardized testing, school-wide assessments, screeners, and data analysis were not viewed as significant enough to warrant class time in my graduate school. In fact, some of our readings argued only the negative aspect
of these tests. Personal judgments aside, these assessments were and continue to be an integral part of my job.

It was during this time, that my mother became my most significant source of support. As a Reading Specialist for twenty-eight years, she demonstrated an expertise in reading instruction and assessment that was admirable. We would spend evenings sitting at the computer looking at the reports, sifting through the numbers and graphs. It was from her, that I began to understand what these reports and screeners truly showed and how I was to adapt my instruction. I have often wondered how I would have developed as a teacher if I had not had a mother that had acted as my mentor and data analysis trainer.

As a beginning teacher entering into a well-established faculty, I felt the constant need to prove myself. Thus, any weaknesses were kept safely hidden within the confines of my classroom. Admitting that I did not know how to interpret or use the data, would be admitting that I did not know what my students needed. Admitting that you did not know what your students needed, would be admitting that you were not prepared for the teaching position. As I began to grow confident in my budding knowledge of data analysis, other novice teachers began to come to me for help. Although it was never discussed, these meetings always took place in one of our classrooms, never in the faculty room or around other veteran teachers. These interactions indicated that I had never been alone in my struggles, my uncertainty, or my hesitation to vocalize my shortcomings.

Six years later, the number of assessments has grown and data are viewed as the only way to make decisions. This school year alone has seen the introduction of the MAP and GRADE assessments. The data from these assessments are used to drive instruction, group students, decide students’ Individual Education Plan (IEP) goals, and determine funding for the
school. Moreover, these data are now included in teacher evaluations. In the coming years, as much as twenty percent of a Pennsylvania teacher’s evaluation will be based upon student performance measures.

My concern escalated as I began to mentor student teachers. These pre-service teachers entered the classroom without any knowledge or training on student testing, data analysis, using data to group students for interventions, item analysis, eligible content, nationally common assessments and screeners, using data to write IEPs, or how to adapt instruction based upon data analysis. In sum, these pre-service teachers are completely unprepared for a significant aspect of teaching.

While data has become the new buzzword in the school setting, it appears as though it has not reached the teacher preparation programs. Furthermore, school districts, whether assuming that novice teachers are already familiar with data-driven decisions or merely confined by their rapidly dwindling professional development budgets, are not thoroughly training new teachers on how to appropriately use data. As Mandinach, Honey, and Light (2006) point out, “Teachers rarely receive pre-service or in-service training. There are relatively few courses offered in teacher training institutions on data, and only recently have such in-service workshops begun to emerge” (p. 13). I recognize that my experiences working with beginning teachers and teacher preparation programs is rather limited. Thus, I am curious if the experiences I have observed are similar to other students in teacher education programs. Through this study, I want to understand beginning teachers’ perceptions of data-driven decision making.
Exploring the Issue

Data-driven decision making is the process of using data to shape and modify instruction. Marsh, Pane, and Hamilton (2006), describe data-driven decision making, or DDDM, as “teachers, principals, and administrators systematically collecting and analyzing various types of data, including input, process, outcome, and satisfaction data, to guide a range of decisions to help improve the success of students and schools” (p. 1). Mertler (2007) defines DDDM as “a process by which educators examine the results of standardized tests to identify student strengths and deficiencies” (p. 136). DDDM has risen to the forefront of educational discussions with the implementation of NCLB. Under NCLB, local educational agencies are required to make constant, data-driven decision-making an integral part of their educational systems (Yell & Drasgow, 2009). This process involves administering assessments, analyzing the results, and adjusting instructional strategies accordingly. States are required to adopt a test-based accountability system that addresses specific subject areas and grade-levels, reports the scores in aggregated and disaggregated forms, and holds school districts and schools accountable for student improvement (Marsh et al., 2006). Moreover, the resulting data are shared with the local school districts, the state, and all stakeholders in order to monitor progress and hold the schools accountable for student achievement (U.S. Department of Education, 2004). Thus, data have become critical for evaluating the success of schools.

The stated goal of NCLB is to determine how individual students are learning and to tailor instruction to better address these needs. In No Child Left Behind: A Toolkit for Teachers (2004), the U.S. Department of Education states:

Although testing is an important part of measuring progress, how teachers use the resulting data from test results to drive instruction is critical. Teachers have the
opportunity to use data from assessments to make good decisions when adapting instruction, evaluating progress, highlighting successes and improving weaknesses. (p. 45)

NCLB aims to provide educators with information about each child that can then be utilized to meet each child’s unique needs. How the data are used and the consequent informed instructional decisions are imperative. With this new educational focus, school districts have begun to consider a prospective employee’s ability to analyze data during the hiring process (Means, Padilla, DeBarger, & Bakia, 2009). Moreover, many states are moving to making student assessment data a component of the teacher evaluation process and basing teachers’ salaries on students’ test scores.

However, research indicates that teachers do not feel well-prepared in regards to making data-driven instructional decisions. “A significant barrier to implementing data-informed decision-making is a lack of expertise among school staff members in the area of data analysis” (Means et al, 2009, p. xii). Novice teachers are not alone in their struggle with assessment data. In a 2006-07 a U.S. Department of Education’s National Educational Technology Trends Study found that fifty-five percent of teachers said that they would like additional professional development regarding adjusting the instructional content and approach in light of student data (Means et al, 2009). Thus, with the increase in testing and data, teachers are left “data rich, but information poor” (Mandinach et al., 2006, p. 12). Teachers are provided with a wealth of information on students and their academic achievements, yet are not trained on how to read, interpret, or utilize the data. “Data-informed educational decision making consists of much more than just a data system: it includes a set of expectations and practices around the ongoing examination of data to ascertain the effectiveness of educational activities to improve outcomes
for students” (Means et al., 2009, p. 1). Time spent on assessment, without then using the data to inform practice, is essentially a waste of instructional time and educational funds.

The gap between pre-service teacher programs and the realities of the teaching profession has been an ongoing concern. As Kinsler stated, “research indicates a divide between the instructional content of college-based teacher preparation programs and real world instructional realities (2008, p.130). This disparity has created under-prepared teachers and is a typical stressor for first-year educators (Tait, 2008). Assessment literacy and data driven decision making are notably absent in many teacher preparation programs. Pre-service programs rarely expose teacher candidates to assessment practices, how assessment data shape instruction, and how to use data to improve student learning (Mandinach et al., 2006; Popham, 1999; Siegel & Wissehr, 2011). While universities focus on educational theory, time is not spent developing educational practices.

As the demand for data-driven instructional decision making increases, the gap between pre-service and in-service teaching programs widens. According to Kinsler (2008), the divide between the instructional content in teacher preparation programs and the realities of instruction needs to be bridged by relevant college-based research and the integration of theory and practice in data-driven instructional planning. Increasingly, data-analysis has become a collaborative effort, with teams of teachers meeting to analyze and discuss data together. However, research states that novice teachers lack the training to become active contributors in the team-based, data analysis process. Kinsler states, “… few pre-service preparatory or in-service professional development programs actively train classroom instructors in the use of team-based inquiry or collaborative data-driven problem solving” (2008, p. 128).
Rationale

Data analysis and data-driven decision making have become common terms in the educational world. With the passing of NCLB, data from the statewide tests are being used to shape curriculum, evaluate the effectiveness of teachers, and to determine the success of individual schools. Moreover, individual teachers are expected to use the data to tailor instruction to meet the diverse needs of individual students. As assessments and public scrutiny have increased, educators are no longer able to escape or ignore data.

Despite the increased pressure to use data, many teachers are unprepared to use data in a meaningful way (Mandinach & Gummer, 2013; Popham, 1999). Novice teachers are entering the field with little or no training in assessment literacy. According to Tait (2008), teaching is one of a few careers where novices are given the same responsibilities as their experienced coworkers. Consequently, novice teachers are expected to be data experts, analyzing assessment reports, using data to drive their instruction, and meet the educational needs of their students. Thus, is it any surprise that teachers are leaving the profession at an alarming rate? Exploration of novice teachers’ experiences with data-driven decision making, a real-life demand of the classroom, will illuminate their perceptions, concerns, and frustrations with education.

Problem and Purpose Statements

Since NCLB, data-driven decision making has become a new focus in the research community. However, interpretation of data, the use of data to make informed decisions, and the resulting effects of the implemented practices on student learning remains largely unexplored (Marsh et al, 2006, p. 1). Moreover, while much of the research focuses on in-service teachers’ ability to make data-based decisions, little research has been done on pre-service and novice teachers’ ability and training with data-driven decision making.
This study explores the dynamic nature of novice teachers’ perceptions and beliefs regarding data-driven decision making. The central research question is: How do novice, elementary teachers perceive their training in and assess the efficacy of data-driven decision making? The subsidiary questions include:

- How do novice teachers describe their pre-service and in-service training involving making data-driven decisions?
- What is the perception of novice teachers on the role of assessment, data analysis, and data-driven decisions in their instructional activities?
- How do principals and colleagues encourage or dissuade novice teachers from engaging in the data-driven decision making process?

Theoretical Framework

The theory of planned behavior (Ajzen, 1991) offers a model that explores the factors that form novice teachers’ intentions to engage in the data-driven decision making process. An extension of the theory of reasoned action, Ajzen’s theory of planned behavior notes that intentions to perform certain behaviors are shaped by attitude, subjective norms, and perceived control. “Intentions to perform behaviors of different kinds can be predicted with high accuracy from attitudes toward the behavior, subjective norms, and perceived behavioral control; and these intentions, together with perceptions of behavioral control, account for considerable variance in actual behavior” (Ajzen, 1991, p. 179). At the core of the theory of planned behavior is the basic principle that human beliefs cannot be separated from behavior. Thus, it seems reasonable to conclude that novice teachers’ perceptions and beliefs regarding data-driven decision making are important, as these will likely shape their intentions, motivations, and eventually their actual use of data-driven decision making.
Planned behavior proposes that three independent factors determine human intentions. The first of these predictive variables is behavioral beliefs, or the person’s attitude toward the behavior. A person’s attitude toward a behavior is determined by their prominent beliefs about the behavior and their perceived evaluations of possible outcomes (Ajzen, 1985). For example, a person may believe that adopting a new instructional strategy may lead to improved student learning, a need for increased planning and preparation time, higher evaluation ratings, etc. “The attitude toward the behavior is determined by the person’s evaluation of the outcomes associated with the behavior and the strength of these associations” (Ajzen, 1985, p. 13). If a behavior will lead to the most positive outcomes or success, then the person will have a favorable attitude toward the behavior. Conversely, a person will have an unfavorable attitude toward a behavior that they believe has the most negative outcomes and leads to failure (Ajzen, 1985). Thus, it is likely that novice teachers’ attitude toward data-driven decision making will be determined by their evaluation of the possible outcomes and the probability of success or failure.

The second antecedent of intention is the subjective norm. Normative beliefs are formed by the positive or negative opinions of important people or groups (Ajzen, 1991). Generally speaking, a person will feel social pressure to engage in a behavior if he believes that significant and motivating people in his life would like him to engage in the behavior. If the person believes that the motivating people in his life would not support his engagement in the behavior, then he will experience social pressure to avoid the behavior (Ajzen, 1985, p.14). “When a person believes that important referents think he should try to perform a behavior, this subjective norm will in most cases be independent of success or failure; it has to do more with the social desirability of trying than with the likelihood of success (Ajzen, 1985, p. 32). Thus, the intention to engage in certain behaviors is formed at least in part by the perceived approval or disapproval
of these significant individuals. These individuals in novice teachers’ life can include supervisors and principals.

Perceived behavioral control is the third predictor. Representing the expansion of the theory of reasoned action, perceived behavioral control accounts for situations in which a person may not have complete internal or external control over the factors that may hinder engagement in the behavior. There are times when a person may intend to engage in a behavior, yet factors out of the person’s control may impede their ability to do so. According to Ajzen (1985),

The success of an attempt to execute the behavioral plan depends not only on the effort invested (the strength of the attempt) but also on the person’s control over other factors, such as requisite information, skills, and abilities, including possession of a workable plan, willpower, presence of mind, time, opportunity, and so forth. (p. 36)

When resources are plentiful, the individual perceives fewer obstacles and challenges to engaging in the desired behavior. A perceived high level of control will strengthen intention, while increasing effort and perseverance (Ajzen, 2002, p. 667). Thus, if a novice teacher believes that she has control over the relevant factors involved in the engagement of data-driven decision making, such as the necessary information, skills, time, and a plan for implementation, she/he will be more likely to engage in data-driven decision making.

Working together, behavioral beliefs, subjective norms, and perceived behavior control can be used to predict intentions and behavior. A person will attempt to engage in a behavior if the disadvantages of failure are outweighed by the advantages of success and he/she believes that the motivating people in his/her life support engagement in the behavior. While these two factors influence intentions, success will ultimately be determined by sufficient control over the internal and external factors that influence successful engagement (Ajzen, 1985, p. 36). “As a
general rule, the more favorable the attitude and subjective norm with respect to a behavior, and 
the greater the perceived behavioral control, the stronger an individual’s intention to perform the 
behavior under consideration” (Ajzen, 1991, p. 188). Thus, this theory of planned behavior may 
help to explain why novice teachers choose to embrace or resist data-driven decision making.

**Significance of the Research**

Although much research has already been done regarding teacher attrition and induction, 
there has been little study on how the new focus on data influences novices’ beliefs about 
teaching. “It is important to consider the potential influence of curriculum and assessments on 
whether new teachers stay in the teaching profession and whether they learn the skills and 
knowledge necessary to succeed” (Kauffman, Johnson, Kardos, Lui, and Peske, 2002, p. 274). 
Mandinach and Gummer (2013) assert that the field will benefit from understanding the 
differences in educators’ needs and how best to accommodate those needs when providing data 
training. While the research involving teachers’ perceptions of data-driven decision making is 
only beginning to emerge, there is very little research that takes into account the differing needs 
and views of novices. In an era where new teachers are fleeing at alarming rates and the testing 
movement is only beginning, the time has come to listen to the voices of this group. Only then 
can we provide the support, guidance, and knowledge that novices require to become successful.
Chapter 2
Review of the Literature

Since there is little current research regarding novice teachers’ experiences with data-driven decision making, I referenced bodies of literature regarding data use and novice teachers.

No Child Left Behind

Education reform movements are a fairly recent phenomenon in the United States. Since the federal government lacks constitutional authority over education, its involvement in education stems from the civil rights and the antipoverty actions of the 1950s and 1960s (Wayman, Spikes, & Volonnino, 2013). Accountability movements gained momentum in the 1970s and 1980s with state requirements to utilize outcome data in site-based decision making, followed by the measurement-driven instruction debates of the 1980s, and later by the strategic planning movement in the 1980-1990s (Marsh et al., 2006). The 1990s also saw the rise of school reform efforts involving the collection and analysis of student learning data (Skalski & Romero, 2011), which have only intensified with the focus on test-based accountability in the past decade (Little, 2012). However, the United States is not alone in its quest for data-based reform, as data-driven decision making has become a global focus, with countries such as England, Canada, and the Netherlands clutching to the promises of data-focused reform efforts (Downey & Kelly, 2013; Earl & Louis, 2013; Schildkamp & Ehren, 2013). Internationally, schools are being held more accountable for the education they are providing and student assessment data are being used as the measuring stick.

In the United States, “the NCLB represents the pinnacle of this historical development” (Wayman et al., 2013, p. 137). According to Marsh et al. (2006), “NCLB required states to
adopt test based accountability systems that meet certain criteria with respect to grades and subjects tested, the reporting of test results in aggregated and disaggregated forms, and school and district accountability for the improvement of student performance (p. 2). At the heart of NCLB, is the testing mandate. While the construction, administration, and passing standards of the tests are left to the states, the federal government requires that an annual standardized test in reading and mathematics be administered to students in grades 3-8 and at least once during grades 10-12; additionally, a science test must be administered at least once during grades 3-5, 6-8, and 10-12 (U.S. Department of Education, 2004). Through the use of standardized testing and reporting, the federal government sought to hold schools accountable for the achievement of its students. “This test is the measuring stick required by the No Child Left Behind (NCLB) to determine if schools make ‘Adequate Yearly Progress’” (Wayman et al., 2013, p. 135). States were required to establish accountability systems that would determine Adequate Yearly Progress (AYP), which would be used to measure schools’ progress toward the 2014 goal of 100% student proficiency (Wayman et al., 2013). “While this policy mandated improved achievement for all through a more widespread and sophisticated use of student data, AYP is mainly based on students’ results on state standardized tests, graduation rates for high schools and an additional indicator for middle and elementary schools” (Wayman et al., 2013, p. 137). If schools fail to make AYP for two consecutive years, a series of sanctions come into effect, including action plans for targeted assistance, and later sanctions such as school choice, the development of improvement plans, new curriculum implementation, and even turning over control of the school if AYP is not met in subsequent years (U.S. Department of Education, 2004). This government policy initiative has forced schools to measure organizational and individual student performance by standardized testing data (Spillane, 2012; Mertler, 2007).
Furthermore, the results of these tests are made available for public scrutiny. “Since the passage of No Child Left Behind, data on school performance, disaggregated by racial/ethnic groups, special education and language status, and gender, are widely available, open to public consumption and intended to lead to improvement” (Goren, 2012, p. 233). Downey and Kelly (2013) state that these external data sources are used to report the effectiveness of schools to the public, forcing schools to be accountable for their students’ achievement. Consequently, the use of data has become the chief focus of schools.

As Wayman et al. (2013) state, “The NCLB set lofty expectations for school districts in terms of data use” (p. 142). The expectation was that districts would know how to improve student achievement (Wayman et al., 2013), and that schools would quickly develop intervention strategies that could target the neediest students (Mandinach et al., 2006). Consequently, data use became the key strategy for improving education at all levels (Coburn & Turner, 2012; Goren, 2012). “The broad implementation of standards-based accountability under the federal No Child Left Behind Act (NCLB) has presented new opportunities and incentives for data use in education by providing schools and districts with additional data for analysis as well as increasing the pressure on them to improve student test schools” (Massell, 2001, as cited in Marsh et al., 2006, p. 2). Spillane (2012) asserts that these pressures not only force schools to utilize data to improve, but it also alters learning and teaching in schools. Under NCLB, schools are being asked to approach educational decisions differently, now relying on data to determine such things as resource allocation and instructional decisions (Mandinach et al., 2006). Moreover, this federal policy has determined for schools what is important and what should be emphasized. Since the educational system is the responsibility of the states, the federal government has wielded the power of the purse to coerce the states’ adoption of NCLB.
Substantial investments of federal money, as well as foundation-funded initiatives, have supported data systems and their implementation (Coburn & Turner, 2012; Mandinach & Gummer, 2013). Prodded by federal mandates, funding, and the threat of public disgrace, a new education culture is emerging.

However, “as a policy, NCLB is a classic example of a policy with great aims, but also great ambiguity” (Wayman et al., 2013, p. 139). While lofty expectations and harsh sanctions were laid out, little guidance was offered for how districts could be successful. Additionally, the use of the same data for both improvement and accountability purposes has created tension (Downey & Kelly, 2013). “Consequently, there remains a substantial gap between NCLB policy and its actual practice” (Wayman et al., 2013, p. 138). Thus, districts, schools, and teachers are struggling with the disconnect between the data-based promises and the reality of the policy’s implementation.

**Data Use**

Due to these reforms and the increase of standardized testing, schools are seeing an “explosion of data” (Earl & Louis, 2013, p. 200; Mandinach et al., 2006, p. 12). From standardized testing to attendance rates, from graduation rates to benchmark testing, data have become inescapable phenomena in schools. Thus, data-driven decision making has become the mantra of educators at all levels of the school system (Marsh et al., 2006; Spillane, 2012). According to Earl and Louis (2013), this proliferation of data has guaranteed that data can neither be ignored nor discredited in the educational decision-making process. Data-driven decision making has become the golden standard and has become the catalyst for new policies, infrastructures, and professional development opportunities. Little (2012) asserts that such efforts have “propelled the invention of new data systems, organizational routines, and
professional roles and have been the impetus for a growing wave of practitioner-oriented guides, conferences, and professional development offerings” (p. 143). Thus, data use has permeated every aspect of public education.

While DDDM is not a new instructional practice, the types of data and the requirements have dramatically changed. Student achievement data currently receive the most attention from policy makers and educational leaders in schools (Earl & Louis, 2013; Marsh et al., 2006). However, school data should not be viewed in isolation, but rather interpreted through triangulation of other data sources (Archer, Scherman, & Howie, 2013). “Data-driven decision making models include data from curriculum, instruction, test scores, lunch programs, budgets, and transportation” (Wargo, 2006, p. 22). Moreover, the use of formative assessment, a common evaluative tool for teachers, has also undergone changes. Formative data are regularly gathered to assess students’ literacy and numeracy skills through universal screeners such as Dynamic Indicators of Basic Early Literacy Skills (DIBELS), Group Reading Assessment and Diagnostic Evaluation (GRADE), Measures of Academic Progress (MAP), and Academic Improvement Measurement System based on the web (AIMSweb); these data are intended to be used to determine and remediate students' specific skill gaps (Skalski & Romero, 2011). Additionally, state departments of education, school districts, and individual schools are beginning to collect and analyze students’ testing data for longitudinal analysis (Mertler, 2007). While the collection and organization of data have dramatically increased, the use of these data to change instructional practice lag behind.

The gap between the intended purpose of the data and its actual use has proven problematic. According to Wayman et al. (2013), “research shows that using data to change instruction is a complex, multifaceted task” (p. 140). Raw data by itself neither answers
questions nor leads to improvement (Earl & Louis, 2013; Goren, 2012; Lai & Schildkamp, 2013). Rather, data become meaningful through the interaction, analysis, and interpretation of the person interacting with the data (Archer et al., 2013; Earl & Louis, 2013; Lai & Schildkamp, 2013; Wargo, 2006). Thus, data do not necessarily lead to improvement, but rather it is the interaction between the data and people that leads to meaningful and relevant decisions. The usefulness of the data is determined by the questions asked and the interpretations of the data. The essence of data-driven decision making is using clear questions to look at data; the questions will determine what data to look at and the range of vantage points from which to approach the educational issue (Earl & Louis, 2013; Mandinach et al., 2006; Wargo, 2006). “By interpret, we mean the sense-making process of trying to understand what the data mean and their implications for future action” (Lai & Schildkamp, 2013, p. 17). Thus, “data mean different things to different people in different settings” (Goren, 2012, p. 235). When using data to make decisions, people select certain aspects of the data to highlight concerns and negotiate possible solutions (Spillane, 2012). Consequently, the meaning of data can change as the questions and interpretations used to analyze the data change. For school-based data-driven decision making, “educators must share common understandings of what data mean and how they are used” (Wayman et al., 2013, p. 144). While data collection was intended to be a quick remedy to educational problems, evidence shows that the presence of data alone does not improve schools. Rather, raw data must be interpreted before it can be utilized in the decision making process.

The interpretations of raw data lead to knowledge. “The prime consideration in building good knowledge, not surprisingly, lies in the quality of the thinking about the data” (Earl & Louis, 2013, p. 202). Data analysis involves knowledge and skill acquisition (Archer et al., 2013). The knowledge acquired from data analysis can highlight students’ strengths and
weaknesses and can be used to guide appropriate action. For example, “data can tell a teacher that students do not have sufficient technical words, but the teacher needs to decide how to address this learning need in the classroom, what kind of instruction to apply, what kind of materials to use, what knowledge the teacher needs to have, and so on” (Lai & Schildkamp, 2013, p. 18). Through the transformation of raw data, to interpretations, to knowledge, data become useful for educational decision making processes. Consequently, data are affecting teachers’ role in the classroom.

As the amount of data increases and data use is continually emphasized through policy and legislation, teachers and school leaders are seeing their work transform (Archer et al., 2013; Lai & Schildkamp, 2013; Little, 2012). In a study conducted by Kauffman et al. (2002), despite not teaching grades that administered the state assessment, over two thirds of the interviewed teachers stated that the state assessment still affected their instruction. Teachers at all levels are now expected to engage with student achievement data (Little, 2012). Teams of teachers, administrators, instructional coaches, consultants, and parents, both willfully and obligatorily, are coming together to interpret data from standardized tests, benchmark assessments, attendance records, graduation rates, dropout rates, etc. (Little, 2012). Being aware of the data and reading the reports are not enough; rather, teachers must utilize the data to drive and justify their instructional decisions. “Adjusting instruction and interventions and better understanding the specific skill gaps and rate of progress of each student requires teachers to use data “formatively” – or to inform and change practice” (Skalski & Romero, 2011, p. 12). After using the data to determine students’ instructional needs, teachers need to develop new, appropriate instructional and assessment methods (Mertler, 2007). Subsequently, “the data-based decision making also has entailments for the professional identities of teachers and school leaders” (Spillane, 2012, p.
133-4). In the wake of the data revolution, teachers are required to look at their instructional and decision-making processes, as well as their definitions of student achievement, differently.

**The Data Use Debate**

**Opposition and concerns.**

Although schools, districts, and countries around the world doggedly cling to the perceived promises offered by data, the use of data-driven decision making in schools is controversial. While schools have become “preoccupied” or even “obsessed” with data (Downey & Kelly, 2013, p. 71), there remains a gap between policy and practice. “There is a need to understand the NCLB/practice gap as it relates to data use and to identify effective practices that can foster positive practice under NCLB” (Wayman et al., 2013, p. 149). While many districts have bought in to the data-driven movement, teachers have approached the reform more hesitantly. Fearing reduced automaticity, the misuse of data through a narrow focus on standardized testing results, the over-simplification of teaching and learning, an overwhelming quantity of both relevant and irrelevant data, and data-based reprimands, teachers have expressed a mistrust of data use.

Historically, teaching has been perceived as an individual endeavor; teachers close their doors and are given complete control to instruct their students as they see fit. Teachers were viewed as competent, well-trained, and knowledgeable of the needs of their students. Since teachers view themselves as professionals, “…teachers expect to have a high level of work autonomy, to serve as their own judges, and to be highly involved in decision making” (Conley, Bacharach & Bauer, 1989, p. 60). Additionally, teachers feel possessive of their students and believe “that nobody [knows] their students better than they [do]” (Kauffman et al., 2002, p. 286). As Lai and Schildkamp (2013) assert,
While many school leaders and teachers agree that it is important for school leaders to use data, some believe that a teacher can be effective without having to use data. As one of the teacher from our study stated: ‘Data use is a task for school leaders, and not teachers. My job is to take care of the children in my classroom.’ (p. 13)

Consequently, outside influences are perceived as an infringement on their professionalism and autonomy. With standardized testing data being used as the determinant for school, teacher, and student effectiveness, teachers likely view this change “as transforming their identities as autonomous professionals” (Spillane, 2012, p. 133). As Mandinach and Gummer (2013) assert, along with the growth of available data is the expectation that teachers will understand how to use “tangible evidence to inform their decisions rather than use anecdotes, intuitions, or personal preferences” (p. 30). Decisions become more top-down than bottom-up (Mandinach et al., 2006), and school bureaucracy encroaches upon teachers’ autonomy (Conley et al., 1989).

“Overall as pressure to improve students’ standardized test scores increased, teacher job satisfaction decreased” (Snow-Gerono & Franklin, 2006, p. 22). Moreover, resistance also arises from the source of the new policies. The standardized testing and data-based endeavors have originated from the federal and state legislators, entities that are far removed from the classrooms. Thus, teachers question the need to follow the mandates created by people who “do not really understand what it is like to be a teacher in today’s schools” (Mertler, 2007, p. 26). According to Downey and Kelly (2013), “some feel that official pupil performance data are collected because “the government doesn’t trust teachers to be professional” and that over-reliance on it detracts from other more important issues in education, “turning schools into factories in a forlorn attempt to measure the immeasurable”” (p. 84). The data received from governmental agencies come “prepackaged and preconstructed” to focus on some issues, ways of
learning, and subjects, and not others (Spillane, 2012, p. 131). Thus, the role of the teacher is being defined by unwanted outside influences. As a respondent in Snow-Gerono and Franklin’s (2006) study shared, “I have a growing concern about the long-term effects of all this standardized testing. I am afraid we are taking the joy and wonder out of education” (p. 22-3).

The focus on standardized testing has robbed some of the joy and spontaneity from teaching. The accountability pressures and consequences have led some educators to begin “teaching to the test.” Teaching to the test is a gross misuse of data, for it replaces deeper, conceptual learning with test-driven skill and a constriction of the curriculum to only tested subjects (Earl & Louis, 2013; Lai & Schildkamp, 2013; Mandinach et al., 2006). This strategy is focused only on passing the test, rather than actual learning (Lai & Schildkamp, 2013). Moreover, the amount of time testing robs from the allotted instructional time is a concern “These critics argue that testing programs that consume weeks of teachers’ and students’ time each and every year are not the most productive or efficient way to collect performance measures of our students’ learning (Mertler, 2007, p. 25). With more testing, there is less time for true instruction (Mandinach et al., 2006). Thus, the test has become the dictator, demanding what is to be covered and how it is to be learned. Teachers have become servants to the test, losing their freedom in the process.

Another concern with the testing and accountability movement is the use of a single test to determine schools’ effectiveness. According to Skalski and Romero (2011), “decisionmakers rely heavily on standardized norm-referenced assessments that provide a snapshot of how individuals or groups are performing compared with a large sample of their peers” (p. 13). However, rather than merely using data as a quick-peek at a schools’ performance, these test scores are often the only data used to make important decisions. Teacher effectiveness is often
being determined by the scores of their students from year-to-year. However, as educators are well aware, each year brings a very different group of students, differing in knowledge, skills, culture, and experiences, than the previous year (Mertler, 2007). Moreover, the accuracy of the test scores should be questioned. As Mertler (2007) asserts,

> On some subtests of most any standardized achievement test, a specific subtest may consist of as few as five or six items. Careless errors committed or lucky guesses by students may substantially alter the score on that subtest, especially if they are reported as percentages or items answered correctly or as percentile ranks. (p. 139)

Thus, states, districts, and schools are basing decisions off of possibly faulty information.

Furthermore, the content and skills on the test do not always align with the local curriculum and instructional methods (Goren, 2012; Mertler, 2007). Consequently, weighty decisions are being made that are not accurate indicators of what is actually occurring in the classroom.

The amount of data collected is a hindrance to use. As Skalski and Romero (2011) state, “Data can be very intimidating” (p. 14). Data are infrequently used because teachers feel overwhelmed by the amount of data the test reports provide (Mertler, 2007; Skalski & Romero, 2011; Vanhoof, Verhaeghe, Van Petegem, & Valcke, 2013). “I have heard teachers comment that ‘There is so much information! I don’t know where to start!’” (Mertler, 2007). School districts, lacking a clear purpose for collecting data, can collect a lot of data, which ultimately proves useless for decision-making (Lai & Schildkamp, 2013). Feeling overwhelmed by the data, educators fail to use data comprehensively (Schildkamp & Ehren, 2013). As Lai and Schildkamp (2013) contend, collecting less data, but using it more, would be a more effective use of time and resources. “Focusing on a few key pieces of information on test reports and essentially ignoring other data is one method of avoiding this overwhelming feeling” (Mertler,
While large quantities of data are intended to provide a comprehensive picture of school achievement, it deters use by making data analysis an overwhelming and insurmountable endeavor.

Not only are teachers deterred by the quantity of data presented to them, but by the quality of the data they receive. Currently, many schools focus on the quantity of data collected rather than the quality of the data (Vanhoof et al., 2013). For many, copious data collection equals compliance to federal and state mandates, as well as a sign of a “great” school. As Goren (2012) assets, “These data may or may not relate to actual classroom or school practices, yet they influence these practices nonetheless” (p. 235). As studies have discovered, the content presented on standardized tests does not match the content of widely used textbooks, which often serve as the curriculum in many classrooms (Popham, 1999). Nevertheless, these same test results, that neither correlate with the curriculum nor the instructional methods, are used to evaluate the effectiveness of each. Rather than using appropriate data, educators frequently use available data to drive their decision making processes (Earl & Louis, 2013). Simply put, “Not everything that matters is measurable, and not everything that is measurable matters” (Eisner, 2005). “Instead, most schools must determine whether they have the right data to inform decision making and improve practice” (Skalski & Romero, 2011, p. 12). The data collected may not necessarily be appropriate for the types of educational decisions being made. Thus, educators need to spend time forming questions regarding which data are relevant (Wargo, 2006). Relevant data should be closely correlated with the reality of teaching and learning within that context (Earl & Louis, 2013). If data are to be utilized meaningfully in the classroom environment, it must be perceived as relevant and of high quality.
The simplification of the individual learner is another concern teachers express regarding the testing and accountability movement. As Mertler (2007) declares, “Human characteristics, motivation, behavior, attitudes, interests, values, and learning styles are just simply too complex to be measured by one test” (p. 26). Rather than being able to be described by a test score, student achievement is “complex and multifaceted” (Wayman et al., 2013, p. 143). With the data-driven decision movement, education is taking a more business-like approach to its task of producing successful members of society. However, the drastic differences between the business and educational worlds, makes this philosophy deeply flawed. As Mertler (2007) states,

In business settings, data is absolutely essential. Information about aspects, such as customers, inventory, and sales, are crucial in determining a business’s success or failure. In contrast, in education we tend to focus on the more human side of things, and rightfully so. Kids are real, living, breathing entities; data is abstract. (p. 137).

With too many extraneous factors involved, describing a child by a number is like judging a cake by tasting a crumb. While the standardized approaches that became popular during the industrial revolution may work in certain situations, there simply is too much variability when looking at children (Eisner, 2005). In light of the testing movement, schools are becoming data-driven, narrowly focused on test scores, and many fear are losing sight of the individual (Downey & Kelly, 2013). As Jeff Burkett, a sixth grade teacher, stated, “What’s frustrating is that it’s one test, one day, one little snapshot picture of a student for two and a half hours of their lives” (Mertler, 2007, p. 182). Nevertheless, this one snapshot is used to comprehensively define the student, delineating his or her strengths and weaknesses. Can children’s complexities and intricacies be represented by a number?
Another hindrance to data-driven decision making is the teachers’ lack of knowledge and supports. As Kauffman et al. (2002) stated, “The stakes are high and supports are few” (p. 292). When implementing NCLB, policymakers assumed that making data-based instructional decisions would be simple – follow the data (Spillane, 2012). However, the policymakers only succeeded in creating “a sense of urgency” without the support needed to systematically use data (Kauffman et al., 2002, p. 279; Mandinach & Gummer, 2013). One of the largest obstacles to making data-based decisions is a lack of the necessary training, knowledge, and skills to meaningfully analyze, interpret, and act upon data (Mandinach et al., 2006; Mokhtari, Rosemary, & Edwards, 2008; Schildkamp & Ehren, 2013; Vanhoof et al., 2013; Wayman et al., 2013).

According to Vanhoof et al. (2013), “This was attributed to the fact that data use is an area to which limited attention was paid during their professional training” (p. 122). Consequently, “districts employ educators who may lack skills and knowledge around data use but who must acquire the capacity to use data” (Mandinach & Gummer, 2013, p. 33). Despite their lack of formal training, data analysis is quickly becoming a requirement of their job.

The negative environment created by NCLB has also deterred teachers from embracing DDDM. As Wayman et al. (2013) states, “The environment created by NCLB is a punitive one, with negative sanctions, and many districts are finding this a difficult environment” (p. 145). Consequently, rather than willfully embracing data-driven decision making, teachers view the use of data as an obligation and a means of survival until the pressures pass (Mandinach et al., 2006; Vanhoof et al., 2013). Rather than pursuing data for their own purposes, most schools react to data (Schildkamp & Ehren, 2013). This mentality coupled with the strong accountability policies can lead to undesirable methods of data use (Earl & Louis, 2013). Such misuses of data
include the evaluation of teacher effectiveness (Earl & Louis, 2013; Mertler, 2007). As Downey and Kelly (2013) assert:

There are other obstacles to the development of data-friendly cultures in schools, such as the tension inherent in the fact that the same data are used for both improvement, evaluation, and accountability-monitoring purposes—the same (yard)stick used by teachers to improve their own performance can also be used as a stick to ‘beat’ them. (p. 72)

Thus, teachers and administrators have “learned to be defensive and wary of data collection and the required assessment tools” (Skalski & Romero, 2011, p. 12). This frustration and mistrust have affected teachers’ buy-in to data-driven decision making (Schildkamp & Ehren, 2013). As was evidenced by the participants in Craig’s study, as well as the NCLB implementation gap, forcing change on teachers does not work for establishing long-term solutions (Craig, 2012).

Despite the widespread belief that accountability and data will be the savior of the school system, critics voice concerns. With the sanctions and negative environment created by NCLB, data are being misused. From measures of teacher effectiveness, an obsession with standardized testing, and a narrow focus regarding what constitutes learning and teaching, data use has been misrepresented. However, data-driven decision making, when used appropriately, can and does have a positive influence on education. Earl and Louis (2013) speculate that higher levels of data use would occur if there was a separation between data and the current high stakes consequences.

Support and benefits.

Through its association with the highly-debated NCLB, the use of data in educational decision making has become tarnished. A positive tool that can lead to sustainable improvement is now viewed by many as just another irrelevant idea imposed by removed policymakers.
However, Wayman et al. (2013) argue that NCLB, despite its imperfections, should not be used as an excuse for poor data use, for there is nothing in the law that prevents districts from utilizing sound data strategies. “Data provide us with tools that we can use in a complex process of understanding issues better, considering nuance and context, and focusing and targeting their work in productive ways” (Earl & Louis, 2013, p. 202). The value of data analysis rests in the taking the time to develop meaningful questions, which can broaden conversations beyond currently held views, beliefs, and biases (Earl & Louis, 2013). The ultimate purpose of data use is to improve teaching and learning, by making thoughtful and defensible decisions based upon relevant data (Archer et al., 2013; Lai & Schildkamp, 2013). Data-driven decision making can lead to sustainable improvement, by providing educators with feedback regarding the effect their instruction has on student learning.

The support for effective data use is resounding in the current body of literature. Systematic, effective use of high-quality data can lead to improved student learning and achievement (Lai & Schildkamp, 2013; Schildkamp & Ehren, 2013; Wayman et al., 2013). Downey and Kelly (2013) assert that staff in data-driven schools believe that data collection is used to serve external reasons; yet, data should be collected and analyzed for internal reasons, such as self-evaluation and improvement. Data use can highlight possible shortcomings that can then be turned into meaningful action for improvement (Vanhoof et al., 2013). Relevant and carefully selected data can be utilized to develop and monitor long-term improvement efforts. However, in order to lead to sustainable school improvement, data use must be embraced by staff at all levels. According to Skalski and Romero (2011),

Although data are often displayed summatively to provide the status of the students or schools in relation to a certain standard or expectation, to ultimately change ineffective
practices and improve student achievement, data must be used by principals and teachers in practices that promote data-based decision making by all school employees (p. 16). In order to be effective, the data obligation mentality must be broken and replaced by data expectations that are focused on school development and responsibility (Vanhoof et al., 2013). By grounding meaningful data use in the routines and culture of the school, educators can promote improved student and school improvement.

One of most significant benefits offered by data-driven decision making is its ability to provide feedback regarding instruction and student learning. This feedback can then be used to meaningfully revise instructional and intervention methods to enhance student learning. Lai and Schildkamp (2013) assert, “Our position is that teachers and school leaders are, together with students, responsible for student learning and that both teachers and school leaders need to use data in order to learn how best to improve student learning” (p. 12). Data provide additional sources of information that are independent from teachers’ observations (Mertler, 2007). In one study, 80% of principals in one district that implemented standard-aligned progress tests reported that the results were moderately to very useful for guiding instructional decisions (Marsh et al., 2006). The focus of data production and use should be to critically look at practice (Spillane, 2012). The results from one study of a school in England, which has an accountability system similar to the one in the United States, found that more than 90% of participants believed student performance data should be collected primarily “to enable pupils to make better academic progress”; about 80% of participants felt that the data should be primarily used to “enable teachers to be more effective” (Downey & Kelly, 2013, p. 85). As Schildkamp and Ehren (2013) assert, “…these data should not be used to blame and shame people, but should be used for improvement purposes” (p. 62). Test results can be used to develop appropriate intervention
strategies for individual students and to revise whole-group instruction (Mertler, 2007). As Lai and Schildkamp (2013) state, “This means that data enable teachers and school leaders to tailor their teaching, school practices, and curriculum to address student learning needs” (p. 15). Through a careful analysis of student data, educators can better meet the academic needs of individual students. As Deb Keily, a middle school principal stated, “Using student data to drive our instruction helps us focus on the individual needs of our students, which promotes high student learning and growth” (Skalski & Romero, 2011, p. 15). At the individual level, standardized test scores can be appropriately used to describe students’ learning abilities, which can then be used to guide instructional modifications to address these individual needs (Mertler, 2007). As Principal Deb Keily in Siegel and Wissehr’s (2011) study contends,

> Once we have accurately identified students’ needs, determining the most efficient and effective way to help them learn becomes the instructional priority. If educators don’t use the information from the student data to change instructional practices, student learning won’t adequately increase. (p. 15)

By knowing how their students are doing, teachers can better adapt subsequent lessons to effectively meet the needs of their students (Siegel & Wissehr, 2011). Moreover, test data can be used to guide intervention strategies, or alternative methods of instruction, by aiding in the development of such programs, allowing for the flexible grouping of students throughout the year, determining students’ response to the intervention method, and refining the procedures as needed (Mertler, 2007; Skalski & Romero, 2011; Young, 2006). Test data can also be used to provide information regarding exceptional students by helping to “pinpoint” learning and developmental problems and initially identify their needs to guide further action (Mertler, 2007, p. 22). Conversely, data can also highlight students that are “just cruising and could do better”
Thus, using data is beneficial in the initial identification of students that would benefit from additional support or challenges. Additionally, test data can be used as a general guide for improving whole group instruction. “Curricular areas identified as weaknesses across a group of students (e.g. a class or a given grade level) may then be targeted for instructional revisions or, at a minimum, for a greater level of focused instruction” (Mertler, 2007). Not doing so, may result in a waste of instructional time. As Principal Deb Keily states, “If we are not looking that deeply into our student data, we are wasting precious time teaching things that students already know or might not need to know” (Skalski & Romero, 2011, p. 15). Such analysis, if based upon data that is well-aligned with the school’s current curriculum and instructional methods, can be used to modify curriculum, instructional, and supplementary materials. As Mertler (2007) states, curricular areas that are identified as strengths can be used to support those areas that are areas of concern. It is important to note, that the use of data is a reiterative process. Data must be revisited, recollected, and reanalyzed frequently in order to remain effective and responsive.

These data showcasing student learning can be used to enhance instruction. “Perhaps the most compelling argument for using data lies in the nature of effective teaching and school leadership (Lai & Schildkamp, 2013, p. 13). The data can provide continuous feedback regarding the effectiveness of instruction, highlighting strategies that were effective and those that were not. In schools where data are meaningfully utilized, teachers have an increased awareness of the quality of their teaching and are consequently improving the quality of their instruction (Ledoux, Blok, Boogarrd, & Krüger, 2009, as cited by Schildkamp & Ehren, 2013). Through the data analysis process, teachers engage in thoughtful discussions, putting a “face” on data by translating them into improved practice (Skalski & Romero, 2011, p. 14). As Mertler
(2007) asserts, “The ultimate goal of this process is for teachers to critically examine their curriculum and their instructional practices relative to their students’ actual performance on standardized tests” (p. 136). While this examination of practice should not be the sole method of evaluation, it can provide an avenue for initial inquiry into practice. Using a critical eye to fine-tune one’s practice will result in enhanced instruction and improved student learning.

Although critics condemn data use based upon its association with state-mandated standardized tests, effective data-driven decision making in schools is often based upon diagnostic assessments. Benchmark assessments and school district-developed tests often provide valuable and relevant information regarding teaching and learning. Recognizing the benefits of data use, yet remaining wary of making decisions based upon one standardized test, districts can analyze state test scores within a larger data initiative (Wayman et al., 2013). “For this reason and others, many districts and schools have adopted formal local tests, given more frequently throughout the year and providing diagnostic information that could be acted on immediately” (Marsh et al., 2006, p. 5). Consequently, assessments such as DIBELS, GRADE, MAP, and AIMSweb have grown in popularity. Marsh et al. (2006) found that elementary teachers in California, Georgia, and Pennsylvania stated that progress tests were more helpful in identifying and remedying students’ academic weaknesses than the state tests. The frequent administration, the quick turn-around for receiving results, the lack of consequences associated with the results, and the close alignment with curriculum, identified these assessments as diagnostic and intended for improvement rather than evaluation (Marsh et al., 2006). Thus, many districts and teachers have embraced the use of benchmark data when designing and revising instruction.
Value-added models of data analysis have been developed. Addressing the complaint that a focus on data wrongfully leads to decisions based upon the comparison of varying groups of students, value-added models measure an individual student’s growth over time. “Instead of comparing students to each other or to a pre-established level of proficiency, value-added analysis compares students to themselves to determine if they are advancing academically; and if so, at what pace” (Mertler, 2007, p. 167). Value-added models control for students’ prior achievement (Marsh et al., 2006), yet are based upon the idea that teachers are vitally important (Mertler, 2007). Value-added models are used to determine if students have made one year’s worth of growth; one year of growth is based upon the students’ individual entering level of achievement and will vary for each student. In response the value-added model initiatives, some states have begun to develop P-16 data systems that can track students’ educational careers from pre-school through college (Chamberlin & Plucker, 2008). Despite the promise offered by the value-added model, teachers’ and principals’ awareness and understanding of this practice is quite low (Marsh et al., 2006).

The increase in available data has made it possible for educators to triangulate data; by basing their decisions on various sources, it is more likely that an accurate interpretation will be made. Standardized test scores, benchmark assessment results, classroom tests, and teacher observations, when combined, can provide a comprehensive picture of teaching and learning. As Mertler (2007) asserts,

As educators, I firmly believe that you will find standardized test results helpful to your instruction and classroom-based assessments, as well as to your students’ learning and achievement, as long as you use that data with a full understanding of its limitations and as only a supplement to the data you gather from students on a daily basis. (p. 27)
Teachers collect student progress data using a multiple of strategies, both formative and summative, quantitative and qualitative (Mandinach et al., 2006). Lai and Schildkamp (2013) describe data triangulation this way: “What we are also advocating is for teachers and school leaders to use these multiple sources for decision-making, much like a doctor uses multiple sources of data to come to an accurate diagnosis of a patient” (p. 12). Teachers and administrators should use all available data sources when making crucial decisions regarding instruction, curriculum, and students (Mertler, 2007). While one source of data should not be used as the basis for decision making, when used in conjunction with other relevant and informative sources, data can lead to sustainable school improvement.

Through its association with accountability demands, data-driven decision is being painted in a negative light. However, when used appropriately, data-driven decision making can lead to sustained school improvement through enhanced student learning and improved instructional practices. Through the plethora of available data and improving data analysis techniques, data-driven decision making is helping educators more effectively meet the diverse and complex needs of individual students. As Wargo (2006) proclaims,

Although the data may seem complex and overwhelming, take the information bull by the horns. Start simply and start small using questions as your guide. Once underway, you will look back wondering how you ever worked without it – leave no data behind. (p. 25)

**Factors That Influence Data Use**

Although the benefits of data-driven decision making have been recognized by most schools, it still is not being implemented consistently. Research has shown that context, collaboration, teacher attitude, teacher skills, and principal leadership affect how data are used in schools (Archer et al., 2013; Downey & Kelly, 2013; Little, 2012; Mokhtari et al., 2008;
Schildkamp & Ehren, 2013; Wayman et al., 2013. As Schildkamp and Ehren (2013) state, “Moreover, schools need to become aware of the importance of having a clear vision and goals, the importance of collaboration in the use of data, the importance of the role of the school leader in creating a ‘data-use culture’ within the schools, where data are used for continuous improvement and not for blaming and shaming” (p. 64). Serving both as a hindrance and as a support, these factors must be analyzed when looking at the data-driven decision making processes in a school.

Context.

Context is crucial for understanding how data use unfolds. Federal and district policies are framed by the environment and “provide a culture around its implementation” (Wayman et al., 2013, p. 142). “The implication here is that assessment and instruction issues are embedded within broader power structures within particular schools and that both are influenced greatly by the decision-making model operating within those schools” (Mokhtari et al., 2008, p. 354). Thus, it can be expected that the response to NCLB’s mandates will vary significantly among schools. “While some organizational routines, such as school improvement planning and teacher supervisions, were similar across schools, there were also considerable differences in the form of particular organizational routines” (Spillane, 2012, p. 120). Consequently, researchers seek to understand how the group factors, organization, and environment influence how data are actually used (Coburn & Turner, 2012). “One size fits all” policies are difficult to successfully implement, for schools exist in diverse contexts (Wayman et al., 2013, p. 139). “Data do not, by themselves, lead to improvement. The context, the setting, and the environment in which data are delivered all matter” (Goren, 2012, p. 236). By looking at individual schools, we can begin to see how the arrangement of the formal organizational structure enables and constrains the use
of data (Spillane, 2012). “To understand how practitioners interpret and use data, it is necessary to understand the context within which this data use unfolds, including classroom, school, and broader policy settings” (Goren, 2012, p. 234). Looking at a school or teacher’s data use, without taking into account the context is problematic.

Context influences data use by determining what data are attended to and for what purposes. “No doubt the cultural surround and context that translate into rationales, needs, and purposes, will determine who uses the data, how they are used, and the sorts of interactions across levels of the stakeholders” (Mandinach et al., 2006, p. 10). The ways in which data and evidence are presented to the educators affects what is noticed and attended to (Goren, 2012). Thus, factors such as the organization of score reports, the dissemination of data, and scheduled time to look at data all influence how teachers make meaning of the data and respond in their classrooms. Archer et al. (2013) look at mapping data paths, which showcases how data are used and who uses the data, in order to facilitate higher levels of use.

Organizational routines, a critical part of context, affect how data are utilized in schools. “Organizational routines are a useful unit of analysis for studying data use because they focus our research on standard ways of doing things in the school and how, if at all, these standard ways of doing things change in response to data use initiatives” (Spillane, 2012, p. 117). Little (2012) asserts that a teacher’s practice is embedded in the routines, scripts, and roles that exist independent from the individual teacher. As Spillane (2012) reports:

First, routines direct our attention to the interactions among school staff, getting us beyond behavior or even the actions of any one individual. It is in these interactions that school leaders and teachers negotiate about what data are worth noticing—meriting their
attention-and what these data mean, if anything, for current practice at the school and classroom level. (p. 117)

These expected standard ways of responding, the “way we do things around here,” can support or hinder teachers’ data-driven decision making. For example, long-established methods of reporting attendance, assigning grades, collaborating with colleagues, and articulating students’ learning to stakeholders can support or challenge new ways of using data. However, routines can be changed by participants and external sources. “Hence, if policy makers and reformers want more and better use of data in everyday practice in schools, organizational routines are likely to be an important mechanism in realizing their goal” (Spillane, 2012, p. 117). According to Wayman et al. (2013), structures make data use easier for practitioners. Thus, through a change in routines, effective data use can be achieved.

A collaborative and supportive culture is another contextual factor that influences teachers’ data use. According to Vanhoof et al. (2013), “School culture, in particular, is an element which respondents repeatedly cited as playing an important role in predicting how the reports were used” (p. 131). “A positive, supportive organizational culture embodies a clear professional working style with no internal or external job conflicts; its organizational climate is open and positive, fostering professional development and a sense of competence” (Gavish & Friedman, 2010, p. 163). Clearly, this organizational culture varies dramatically from the punitive environment that uses test scores as a single measure to evaluate and punish teachers and schools. However, it is when the culture of a school views data-driven decision making as an effective way to meaningfully improve practice that teachers feel supported enough to face the risks involved with changing their practice. Administrative support and encouragement seems to enhance teachers’ data use (Schildkamp & Ehren, 2013, p. 62). By encouraging
teachers to reflect on their practice and by dedicating time for staff to collaboratively review, analyze, and discuss data, administrators can help promote common understandings regarding the value of the data and the purpose of data (Skalski & Romero, 2011; Wayman et al., 2013). Data use is confined or improved by the culture of the school.

**Collaboration.**

Collaboration is another contextual factor that affects DDDM. Research asserts that collaboration should be supported by schools, for it is vital for effective data use in informing practice (Downey & Kelly, 2013; Schildkamp & Ehren, 2013; Wayman et al., 2013). Collaboration allows staff to use data to determine their success in reaching their goals and make decisions accordingly (Schildkamp & Ehren, 2013). Scholars define data use as a fundamentally interactive endeavor; even the lone wolf teacher interacts with others in the school when analyzing data (Coburn & Turner, 2012). Collaboration can be formal and informal, structured and unstructured. While much of the focus is given to formal collaborative times, informal interactions are important and should not be ignored (Spillane, 2012; Wayman et al., 2013). It is through these interactions with others, that teachers begin to make sense of their world.

It is through collaboration that communities define their identity and practice. As stated previously, the accountability and data-driven movements have redefined what it means to be an educator. Collaboration is critical for helping teachers explore their school, practice, and identity as it is defined by data use. “Specifically, interactions among school staff using data to make decisions about their schools’ instructional programs also involve renegotiating professional identities and power in schools” (Spillane, 2012, p. 133). Moreover, collaborative interactions determine what data are noticed, why they are noticed, as well as how teaching and learning are viewed (Spillane, 2012). This shared meaning and understanding provides teachers “with
something to hold on to, a structure for using data” (Schildkamp & Ehren, 2013, p. 62). These understandings not only determine how data are viewed, but also shape practice. As Spillane (2012) states,

As school leaders and teachers increasingly use these resources and rules to interact with one another in the performance of their everyday work, the intermental models embodied in these resources and rules - of fundamentals such as what it means to be a successful third-grade mathematics student - shape practice, often in taken for-granted ways. (p. 128)

Collaboration defines data-driven decision making, determining how it will be used and for what purposes.

Combining the importance of collaboration with the benefits of data-driven decision making, data teams are becoming common practices in schools. Schildkamp and Ehren (2013) state “data use should not be an individual effort but should be a team effort, for example, a data team effort” (p. 62). According to Skalski and Romero (2011),”teachers need structured times to meet to discuss data and determine which data are relevant” (p. 12). Exemplary schools set regular, formal meetings where staff can interact with the data, analyzing the results and monitoring progress (Archer et al., 2013; Schildkamp & Ehren, 2013). Data analysis meetings involve the entire staff, from teachers to school leaders, encouraging everyone to improve educational practice (Schildkamp & Ehren, 2013). Wayman et al. (2013) expand on this idea, stating that collaborative data teams should cross roles, including teachers, principals, instructional support staff, and central office administration. Data teams may also include members from outside the immediate school environment. An outsider’s perspective can give members of the school community new insights and perspectives that may be a surprise (Vanhoof et al., 2013). However, educators need both pre-service and in-service training on
team-based data-driven problem solving (Kinsler, 2008). With the proper training, team-based data analysis can lead to student and school improvement at all educational levels.

**Teachers’ attitude.**

Teachers’ attitude regarding data-driven decision making plays a significant role in the effective use of data. Vanhoof et al. (2013) call for “explicit attention” to be paid to attitudes regarding the use of data (p. 116). Positive attitudes toward data use are a requirement for effective data-driven decision making (Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006). Downey and Kelly (2013) expand on this idea, stating that teachers’ professional attitudes toward data use are shaped by their emotional response to data sources. Emotional responses can be shaped by teachers’ perceived success and failure. “That is, educators are more likely to try new uses of data if they feel it is worth their time and that any potential failures will not be penalized” (Wayman et al., 2013, p. 144). However, the punitive atmosphere created by NCLB thwarts risk-taking. “Shifting to a more open and engaged attitude is often especially uncomfortable and difficult for teachers because of accountability expectations at the state and federal levels” (Skalski & Romero, 2011, p. 12). Thus, in order to encourage teachers to engage in data use, schools must demonstrate that attempts to build capacity will not result in personal loss (Wayman et al., 2013). In addition, the perceived value of the result of engaging in data-driven decision making will shape teachers’ attitude. If teachers’ believe that engaging in data use will be of a personal benefit, they will be more likely to embrace data-driven decision making. Thus, teachers should be allowed to develop their own questions to guide their own inquiry into data analysis (Earl & Louis, 2013). When exploring a school’s data-driven decision making process, researchers should take note of teachers’ attitudes.
Principal leadership.

The systematic use of data has marked a fundamental shift in not only teachers' practice, but that of principals as well (Shen, Cooley, Reeves, Burt, Ryan, Rainey, Yuan, 2010). "Today's principal is expected to be able to skillfully collect, organize, analyze, interpret and use a variety of data in order to improve instruction, services, and programs for students and, ultimately, improve academic achievement and other student outcomes" (Fox, 2013, p. 12). With the diversity of the student populations increasing, schools need "strategic decisions based on deep understanding of the school context, student needs, and student performance profile" (Reeves & Burt, 2006, p. 66). Thus, principals must use data to develop an understanding of the complexities of the school. Moreover, the principal realizes that data are imperative for monitoring school, staff, and personal continuous improvement (Fox, 2013, p. 13). Consequently, data use has taken a prominent role in the responsibilities of the principal.

Not only must principals know and model how to use data, but they must use their position to establish a data-focused culture, provide needed resources and routines, and supportively guide teachers as they formatively use data to guide their instruction (Skalski & Romero, 2011; Wayman et al., 2013). As Fox (2013) asserts, "In addition to improving her own skills, the principal is expected to promote data-driven decision-making among her staff, facilitate high-quality data discussions and be able to explain data reports and concepts in simple language" (p. 12). Thus, the principal must not only be confident in his data analysis skills, but must act as a data analysis leader, mentor, and advocate for his staff. “The principal is the first professional figure with whom teachers have contact in the school, and is therefore a significant factor in ensuring a smooth adjustment and professional accomplishment (Gavish & Friedman, 2010, p. 162).
The principal's attitude is an important factor in determining how data will be used in the school. "The principal's mind-set will either promote or impede her ability to use data to improve her school. Without the appropriate mindset, the time and effort invested in the data will be useless" (Fox, 2013, p. 13). The principal sets the tone for how data will be viewed and embraced by teachers, students, and the external community (Skalski & Romero, 2011). Fox (2013) states that principals demonstrating an appropriate mind-set toward data-driven decision making believe data are imperative for decision-making and problem-solving, understand that data are a means to an end, not an end in itself, and believe that establishing a continuous improvement culture is central to his responsibilities. Moreover, principals' perceptions of teachers and their willingness to use data also influence how data will be used in the school. Reeves and Burt (2006) assert that principals feel that teachers possess even less understanding and appreciation of data than themselves, that teachers do not have time to meaningfully analyze data, that teachers use student attitudes as an excuse for poor test performance and score reports, and that teachers feel stressed and suffer from low morale when forced to look at data with limited time. It is through the beliefs, perceptions, and actions of the principal, that the tone is set for how data will be used in the school.

Yet, despite the benefits of a strong data-driven school leader, many principals struggle with their use of data. Principals' frustration with using data arises from lack of time, little common understanding among teachers and district leaders as to what data are important and what the data mean, an overwhelming amount of data, and inadequate technology to effectively manage the data (Reeves & Burt, 2006). In addition, many principals, like teachers, are wary of the demands pressing down on them from the local and state levels. Reeves and Burt (2006) report, "Discussions with principals revealed animosity, cynicism, mistrust, and a general lack of
confidence at both the district and state policy levels" (p. 71). Perhaps most importantly, principals' struggles with data-driven decision making arise from their lack of training and knowledge to use data effectively (Fox, 2013; Militello, Bass, Jackson, & Wang, 2013; Reeves & Burt, 2006; Shen et al., 2010). Not only do principals often lack the support of data specialists that can assist them and their staffs in using the data (Militello et al., 2013), but they feel that their administrator-preparation program did not prepare them to analyze data (Reeves & Burt, 2006). Consequently, principals cite disaggregating data by subgroups as a challenge, using it only for the reporting process, rather than for meaningful school improvement (Reeves & Burt, 2006; Shen et al., 2010). Using data to work with parents and the community, using data to improve the curriculum and instruction, and developing strategies for improving teaching and learning are underutilized by principals (Shen et al., 2010). Reeves and Burt (2006) further this finding by stating, "In addition, principals clearly need help in developing data-based strategies for monitoring teacher and student progress and fostering changes in attitudes, assumptions, and culture" (p. 70). In light of the many struggles faced by principals, it should not be surprising that Shen et al. (2010) found that through their interviews of sixteen principals, that data were used to inform principals' decisions to a "limited extent" (p. 450).

Despite the struggles faced by principals, the research clearly indicates that effective principal practices can support and encourage teachers' successful data-driven decision making. One effective practice is creating a data literate environment which includes a comprehensive plan for data use within the school (Militello et al., 2013). Principals can demonstrate their support of teachers’ data use by allowing time for staff to interact with the data, visiting classrooms, and attending meetings regarding data-driven decision making (Archer et al., 2013; Wayman et al., 2013). Part of this data culture is the understanding that principals and teachers
must dedicate themselves to "sustained, job-embedded professional development geared to understanding and using data to make effective decisions" (Reeves & Burt, 2006, p. 67). One of the many positive outcomes of a data literate culture is increased effectiveness. According to Fox (2013), "Increased effectiveness is the result of skillfully gathering, organizing, analyzing, and interpreting data, and then setting a course of action that will be monitored and adjusted as it is implemented" (p. 16). Another effective practice is encouraging discussion around the question "What now?" As one principal stated, "I ask the teachers to tell me, "What trends do you see in this data? What is this data telling you?" I provide the time for them to do that, and then we set goals: What are we gonna do with this data to keep us from just being a test-driven district?" (Yeh, 2006, p. 636-7). Fox (2013) recommends that each time that data are analyzed the principal should allot one-third to one-half of the time to discussing the question "As a result of our analysis, what are we going to do?" (p. 15). The answers to these questions should be used for curriculum mapping and adjusting instruction (Shen et al., 2010), as well as the reorganization of staff (Fox, 2013, p. 13). Through the establishment of a data-driven culture and a focus on improvement, principals can create a school environment that supports and encourages teachers as they use data. According to Wayman et al. (2013), school-based leadership is critical for promoting the successful use of data.

### Teacher training.

Teachers’ knowledge of data use and the data-based decision making process are crucial for establishing effective data practices. Yet, most educators are not trained in testing and measurement, making assessment literacy a concern (Popham, 1999). Mandinach and Gummer (2013) assert “There has not been a coordinated effort to train current and future educators to use data” (p. 31). “Since testing programs are not going away, educators should be better aware of
how to use the information provided in a positive manner” (Mertler, 2007, p. 29). Thus, educators at all levels and throughout their careers must receive training in how to use data in order to develop the capacity to improve practice (Goren, 2012; Mandinach & Gummer, 2013).

Of special concern are novice teachers. Despite Snow-Gerono and Franklin’s (2006) call that teacher educators must prepare beginning teachers to be assessment literate, novice teachers are entering the data-rich profession unsure of how to proceed. “In the midst of the heightened scrutiny accompanying the standards movement new teachers today may be especially likely to seek tangible sources of guidance” (Kauffman et al., 2002, p. 275). However, research indicates that neither teacher preparation programs nor in-service professional development opportunities are providing the training that these novice teachers need. “There are relatively few courses offered in teacher training institutions on data, and only recently such inservice workshops begun to emerge” (Mandinach et al., 2006, p. 13). Ironically, teachers are being forced to engage in practices with high-stakes consequences, yet receive no training or guidance.

**In-service professional development.**

If schools are serious about building their staff’s capacity to meaningfully use data, then they must invest in training. However, the lack of training and guidance offered to teachers regarding how to effectively use data to improve instruction and student achievement has been a long-standing problem (Kauffman et al., 2002; Mandinach et al., 2006). Training the current cohort of teachers is certainly a costly and daunting endeavor (Mandinach & Gummer, 2013). However, the need to invest in training on the collection, analysis, interpretation, and use of data is needed in order to make educators data literate (Schildkamp & Ehren, 2013). It is ludicrous to expect teachers to possess these skills without pre-service or in-service training (Schildkamp & Ehren, 2013). In order to be successful, teachers must learn how to correctly view data and
respond accordingly (Skalski & Romero, 2011). Educators lack the basic knowledge of how to read, interpret, and understand the data (Mandinach et al., 2006; Vanhoof et al., 2013). Mokhtari et al. (2008) have found that, despite the significant amounts of time invested in collecting assessment data, educators did not know how to organize the data and use it efficiently in instructional decision making. As Schildkamp and Ehren (2013) state,

Schools that lack the skills to analyze and interpret data may use data incorrectly (e.g. interpreting student achievement data wrong when failing to take input characteristics of students into account) and make the wrong decisions on, for example, the provision of extra instruction to students. (p. 63)

Thus, data use morphs from a beneficial activity to a possible detrimental enterprise. “Educators at every level must know the properties and uses of the data they examine, they must know how to operate computer systems to access these data, and perhaps most importantly, they must know how to adjust practice or process based on these data (Wayman et al., 2013, p. 144). Archer et al. (2013), touting the benefit of training, even call for such training to be mandatory. Downey and Kelly (2013) argue that training on data use impacts teachers’ confidence and willingness to engage in data-driven decision making.

The current body of literature has begun to highlight effective procedures for professional development on data-driven decision making. First, receiving training on at least an annual basis has been shown to improve participants’ understanding and confidence regarding data use (Downey & Kelly, 2013). Second, professional development settings must be viewed as “safe” environments, where educators can struggle over the meaning of data and express their uncertainties free from punishment and judgment (Little, 2012, p. 157). Third, the professional development opportunity must be facilitated by experienced and credible individuals (Goren,
Finally, a growing number of effective professional development programs involve the analysis of student work samples as a means for teaching data analysis strategies and promoting deeper understanding (Little, 2012). While the growing body of research is beginning to identify effective data use training methods, teachers at all levels still lack the necessary knowledge and skills to use data properly.

**Pre-service training.**

The lack of in-service professional development opportunities seems to presume that teachers enter the field well-prepared to engage in effective data use. However, novice teachers enter the data-obsessed profession ill-prepared for the new demands of the profession. Research indicates that there is a serious divide between teacher preparation programs and the realities of teaching (Bain & Moje, 2012; Kinsler, 2008; Popham, 1999; Tait, 2008). Whether due to the “absence of organizational efforts to orient novice teachers” or “defects in the teacher-training program” (Gavish & Friedman, 2010, p. 161), novice teachers often experience distress and burn-out at the commencement of their careers. When asked how their data analysis skills could be improved, teachers responded by reporting that data use should take a larger role in teacher preparation programs (Downey & Kelly, 2013). Consequently, Snow-Gerono and Franklin (2006) state,

> We note a pressing need for an emphasis on assessment literacy in initial teacher preparation to help new teachers manage the stresses of tests and accountability while knowing what is best for students’ learning for understanding. Teacher educators must address alternative assessment as well as more traditional means of assessment and evaluation such as statistical analysis. (p. 23)
Siegel and Wissehr (2011) take a similar stance, asserting that developing assessment literacy in teacher preparation programs can provide novice teachers with the skills, knowledge, and confidence needed to effectively use assessment to improve student learning. Additionally, a focus on assessment literacy in pre-service programs could lead to improved curriculum integration, as well as multiple assessment measures (Snow-Gerono & Franklin, 2006). Mandinach and Gummer (2013) express a vision of teacher preparation, where candidates are exposed to data early and are encouraged to use data throughout their careers.

Yet, instruction regarding data use is a rarity in teacher preparation programs. “Undergraduate courses for teacher candidates seem to be sporadic, most often with instruction on data-driven practices subsumed in existing offerings, such as measurement, statistics, instruction, or methods” (Mandinach & Gummer, 2013, p. 32). Although data-driven decision making is emphasized by policymakers, there is little evidence on how teacher preparation programs are preparing their students to address these new mandates (Mandinach & Gummer, 2013). Moreover, few pre-service programs provide instruction in team-based problem solving (Kinsler, 2008). As stated earlier, team-based problem solving is growing in popularity as more districts are utilizing data teams to analyze and apply data. “Unfortunately, too few teachers are trained in collaborative, data-driven problem solving, thus perpetuating teacher isolation and the seeming enormity of the pedagogical needs these students present” (Kinsler, 2008, p. 131). Thus, teachers graduate from teacher preparation programs lacking the critical skills necessary for success in the teaching profession.

However, as Mandinach and Gummer (2013) assert, introducing data use into teacher preparation programs is a complicated endeavor. In addition to the influences of multiple stakeholders on the teacher training program, it remains unclear whether schools of education
perceive a sufficient need to change the current teacher preparation program (Mandinach & Gummer, 2013). The continued partnership between the teacher training program and current teachers and leaders will aid in the development of a comprehensive, appropriate education for beginning teachers (Mandinach & Gummer, 2013; Snow-Gerono & Franklin, 2006). Additionally, the “hodgepodge” nature of teacher preparation programs (Bain & Moje, 2012, p. 62) makes ensuring all teacher candidates are well versed in data use a challenge. Many teacher programs suffer from an internal disconnect; there is little coherence between classes, professors, and student teaching experiences (Bain & Moje, 2012; Snow-Gerono & Franklin, 2006). Despite the possible challenges, it is imperative for university-based teacher preparation programs to include data use in their programs.

**Further Research**

As the body of literature grows regarding the use of data, there still remain some noticeable gaps. As Little (2012) notes, “the field is sparse, especially in light of the escalating level of reported practice…” (p. 150). As Coburn and Turner (2012) argue, in spite of all the policy efforts, there remains “shockingly little” research regarding how people in schools interact with data” (p. 99). There is a need for work that captures the context, content, practice, and relationships that exist as people interact with data (Goren, 2012). According to Mandinach and Gummer (2013), “Another gap in the field’s knowledge base is whether the use of data changes classroom practice and, ultimately student performance” (p. 34). Little (2012) notes, “Investigations of what teacher and others actually do under the broad banners of data use, evidence-based decision making, or evidence-based practice remain relatively underdeveloped” (p. 144). In addition to exploring how teachers make sense of data, there is a need to explore how teachers acquire data literacy (Mandinach & Gummer, 2013). As Mandinach and Gummer
(2013) assert, “Research is needed to understand data literacy preparation needs of teachers as opposed to administrators and of novices as opposed to experts” (p. 35). While the use of data has grown in popularity, little research explores how teachers understand and make meaning of data.

Moreover, there is a need to explore data use as it unfolds in the natural context. According to Little (2012), current information regarding teachers’ data use practices come from interview- or survey-based reports. However, Spillane (2012) argues, “researching data use should be in part about the study of practice in schools so that we can understand how school staff use data and what sorts of data they use in their everyday work” (p. 114). In order to fully understand how teachers attempt to use data in their practice, researchers must spend time in the field, observing and interviewing.
Chapter 3
Research Design and Methodology

Introduction

With 2001’s No Child Left Behind Act, accountability rose to the forefront of educational initiatives. Consequently, standardized testing and the resulting data have inundated schools. “Because of this increase in testing, schools are faced with an explosion of data” (Mandinach et al., 2006, p. 12). However, the availability of data alone does not necessarily lead to an increase in teacher and school effectiveness. As Light (2004) adds, data must be given meaning in context in order to create information; the collection of useful information creates knowledge, which ultimately guides action (Mandinach et al., 2006). Thus, without analyzing the data in context and using this new knowledge to shape instruction, data from standardized testing remains a meaningless set of neatly organized numbers and graphs.

As more instructional time is dedicated to assessment, the expectation is that teachers will use the resulting data to make effective instructional decisions. However, teachers are overwhelmed with the amount of data and feel that the data are not readily translatable into useful information and knowledge (Mandinach et al., 2006). Moreover, teachers, especially novice teachers, generally lack the training and skills to engage in meaningful analysis of the data. Faced with the daunting demands of the job, a lack of preparation and training, novice teachers are deciding to leave the profession at an alarming rate.

This study explored the dynamic nature of novice teachers’ perceptions and beliefs regarding data-driven decision making. The central research question was: How do novice,
elementary teachers perceive their training in and assess the efficacy of data-driven decision making? The subsidiary questions included:

- How do novice teachers describe their pre-service and in-service training involving making data-driven decisions?
- What is the perception of novice teachers on the role of assessment, data analysis, and data-driven decisions in their instructional activities?
- How do principals and colleagues encourage or dissuade novice teachers from engaging in the data-driven decision making process?

**Researcher Identity**

I have a long history with the selected research site. I went through the district as a student and later completed my student teaching practicum in the district. I began my teaching career in the district and have been employed as an elementary classroom teacher there for six years. Additionally, my mother is an employed teacher in the district and my father served on the School Board. During my internship with a principal in the district, I developed the School-wide Improvement Plans for two elementary schools, which highlighted the strengths and weaknesses of the school and developed a plan for data use. Through my experiences in the district, I have an understanding of what it is like to be a student in the school system and to be a novice teacher in the district. During my time in the district, I have worked in different schools and for various principals. However, since the commencement of my career, I have witnessed a shift in the expectations and demands novice teachers face.

My experiences give me a basic understanding of the inner workings of the district, the leadership styles of the principals, and the expectations for data use. While being an insider in the district is beneficial, it can also be a limitation. Before I enter the research site, I already
have biases, opinions, and judgments that may serve as blinders during data collection and analysis.

**Rationale for a Qualitative Approach**

This study’s research problem dictated a research approach that provides a holistic picture with rich description and deep understandings. Thus, a qualitative research approach is best suited to the demands of this study.

Qualitative research provides thick description. “Thick description is more than mere information or descriptive data: it conveys a literal description that figuratively transports the readers into the situation with a sense of insight, but also of the texture, the quality, and the power of the context as the participants in the situation experienced it” (Owens, 1982, p. 8). In order to understand the influential factors that begin to shape novice teachers’ beliefs, the researcher must actively become immersed in the novice teachers’ world. Rich description allows the researcher to convey the complex concepts of culture and belief systems to readers outside the immediate setting. Without thick description, the complexity, texture, and richness of the teachers’ stories are lost.

As the research questions and theoretical framework indicate, novice teachers’ beliefs are shaped by the complex interaction of various factors. “…Qualitative research can reveal how all the parts work together to form a whole” (Merriam, 1998, p. 6). Moreover, case studies provide a holistic picture of the phenomenon. According to Yin (2009), the case study approach allows researchers to “retain the holistic and meaningful characteristics of real-life events” (p. 4). When exploring the factors that influence a novice teacher’s intentions to engage in data-driven decision making, it is vital to analyze the interplay between all relevant factors and the greater context. In other words, merely looking at and gathering data on isolated variables will not
sufficiently explain novice teachers’ decision to engage in data-driven decision making. Therefore, a holistic understanding, which qualitative research provides, was necessary for understanding the phenomenon as a whole.

The purpose of this study was to explore novice teachers’ beliefs and perceptions; the data collection methods associated with qualitative research were well suited for this task. Observation, interviewing, and document analysis are data collection techniques common in qualitative research. Interviews are important for creating meaning and exploring belief systems. As Rist (1982) states, “Like an engaging conversation, there is participation by all involved. Ideas and perceptions are exchanged, information is shared, and participants come to know more about each other in the process” (p. 443). Through the triangulation of data sources, validity is increased. While interviews provide the researcher with the participants’ point of view, document analysis and observations can deepen understanding. Through rich conversations, time spent observing the participants, and the analysis of relevant documents, the investigator can see the “real” world as the participants experience it (Owens, 1982, p. 7).

**Justification for Research Design**

The research design best suited for this study was the specific case design. According to Creswell (2013), “the intent of the case study may be to understand a specific issue, problem, or concern (e.g., teenage pregnancy) and a case or cases selected to best understand the problem (p. 98). Schram (2006) adds, “In sum, the value of case study lies in facilitating appreciation of the uniqueness, complexity, and contextual embeddedness of individual events and phenomena” (p. 107). Through the experiences of novice teachers, this study explored how complex factors, such as context and behavioral attitudes, influenced novice teachers’ beliefs regarding data-driven decision making.
The purpose of this study was to explore the process of how novice teachers’ perceptions of data-driven decision making developed throughout the beginning of their careers. In a case study design, “the interest is in process rather than outcome, in context rather than a specific variable, in discovery rather than confirmation” (Merriam, 1998, p. 19). In this study, the focus was not on novice teachers’ implementation of data-driven decisions, but rather the factors that influenced their decisions as whether to embrace or reject data-driven instructional decision making.

Moreover, in case studies, the context and the phenomenon are inseparable (Yin, 1981). Intentions to engage in a specific behavior are shaped by subjective norms, experiences at the school, and available resources, all of which are part of the context (Ajzen, 1991). Thus, novice teachers’ perceptions of data-driven decision making are likely shaped by their experiences in the school, such as the school setting, the leadership, the influences of co-workers, the requirements of the position, and their own perceptions and beliefs. The case study approach allowed for the interaction between context and novice teachers’ beliefs to be explored.

In addition, case studies look at bounded systems. A case study is an analytic inquiry of a clearly-defined, specific phenomenon (Schram, 2006). “The bounded system, or case, might be selected because it is an instance of some concern, issue, or hypothesis” (Merriam, 1998, p. 28). In this study, the bounded system was the data-driven decision making of novice elementary teachers in the selected school district.

Case studies look at contemporary events. The use of data from standardized assessments to make instructional decisions has risen to the forefront of educational policy and practice initiatives in the years following NCLB (Mandinach et al., 2006). As Mandinach et al. (2006) noted, “Researchers at the UCLA Center for Research and Evaluation, Standards, and
Student Testing (CRESST) note that ‘data-based decision making and use of data for continuous improvement are the operating concepts of the day’” (p. 3). The use of standardized testing, school accountability, and data-driven teaching have been whipped into a frenzy of controversy and discussion fit for the front page of newspapers, nightly news headlines, and scholarly research journals.

For the purpose of this study, a single case design was used. In order to understand how context affects novice teachers’ beliefs regarding data-driven decision making, this study looked at a novice teacher in each of the elementary schools within the selected district. Through the replication of data collection and data analysis procedures, the key factors were analyzed across the various settings. “For such a design, the use of three or four cases has been found sufficient; once a phenomenon has been showed to occur in all cases, the concluding step is to develop a general explanation or synthesis across cases” (Yin, 1981, p. 102). By selecting multiple individuals within the district, the study provided an explanation of how novice teachers’ beliefs were formed.

**Site Description and Sample Selection**

Selecting an appropriate site is paramount to a good research study. Creswell (2013) states,

This is not a probability sample that will enable the researcher to determine statistical inferences to a population; rather it is a purposeful sample that will intentionally sample a group of people that can best inform the researcher about the research problem under examination. (p. 147)

For the purpose of this study, a school district in central Pennsylvania was selected.
This district was appropriate for this study, as it was large enough to have multiple elementary schools. The district has four kindergarten through third grade elementary schools. One novice teacher was selected from each school; thus, the district provided the opportunity for four different cases. By having multiple schools involved, the study was able to show whether a large, over-arching dedication to data-driven decision making at the district level reached individual schools and influenced novice teachers’ experience with data-driven decision making. According to Ajzen’s theory of planned behavior, subjective norms, attitude, and available resources influence intentions to engage in a stated behavior (1991). Thus, it was suggested that by having slightly diverse sites and contexts, differences in novice teachers’ beliefs would arise.

This particular school district has been struggling academically and initiated a drive to implement data-driven decision making throughout the system. According to the 2011-2012 Academic Achievement Report, the district is currently in warning status (Pennsylvania Department of Education, 2012). While three of the elementary schools made Adequate Yearly Progress (AYP), none of the intermediate schools made the proficiency goals (Pennsylvania Department of Education, 2012). In order to improve the quality of education, the district has turned to using data to make instructional decisions. The district's data use is semi-determined by the state. In addition, stipulations from grants determine what assessments are administered, how data are looked at, and the role employees, such as literacy coaches and the data liaison, will play in the data use process. Whether appropriate or not, through state and federal mandates, the district was told how to look and report the data. The teachers at each school met at least twice a year for grade-level data analysis meetings. During these team meetings, benchmark data were analyzed, goals for the coming months were set, and students were placed into flexible groups based upon their instructional needs. Furthermore, the elementary teachers met for bi-weekly,
grade-level meetings to look at student progress monitoring data. During these meetings, teachers shared how they were using data to drive instruction and the student groups were adjusted as necessary. The elementary schools in the district were also beginning Student Intervention Response (SIR) meetings. Following a rigid script, teachers brought data on a student who was struggling academically to the team meeting. While discussing the student, only the student’s data could be shared; personal opinions, biases, and thoughts were strongly discouraged during the twenty-five minute meeting. Following each of these various data meetings, the teachers were required to complete the requisite forms and submit them to principal and central administrative staff. Clearly, the district adopted this initiative to encourage teachers to use data-driven decision making.

Through the use of multiple assessments, the teachers in the district were provided with various sources of data. The assessments utilized by the district were determined by state and grant mandates. The Pennsylvania System of School Assessment was the standardized, high-stakes assessment that was given to students in third through eighth and eleventh grades. This assessment was used to determine AYP. Students in grades kindergarten through fifth grades were given the Dynamic Indicators of Basic Early Literacy Skills (DIBELS Next). Based upon the grade-level, students were assessed on reading skills, such as phonemic awareness, nonsense word decoding, oral reading fluency, and retell fluency. There were three benchmark periods with frequent progress-monitoring in between. In addition, the district administered the Group Reading Assessment and Diagnostic Evaluation (GRADE) three times a year. This assessment was given to students in pre-kindergarten through the secondary level and focused on reading and listening skills. The GRADE assessment came to the district as a requirement of the Keystones to Opportunity Grant. In addition to formal assessments, teachers also administered
informal, diagnostic assessments. Examples include the Phonological Awareness Screener, the Quick Phonics Screener, and the Spelling Inventory. The numerous assessments administered in the district provided teachers with a variety of data that could be used to evaluate students’ progress and to tailor instruction accordingly.

As the literature and the theoretical framework suggested, professional development and training were determining factors for engaging in data-driven decision making. The selected district was awarded the Keystones and Opportunity Grant during the 2012-2013 school year. Consequently, the district would receive $1.5 million dollars each year for two years, with the possibility for an additional three year extension. According to the Pennsylvania Department of Education (2013), the grant is intended to improve literacy outcomes through improving learning outcomes, data-based decision making, and integrating technology. Professional development was central to the grant; teachers were required to attend nine professional development trainings based upon the goals of the grant. Moreover, recipients of the grant were required to hire a data liaison. The selected district had a full-time data liaison and a part-time data assistant to manage assessments and process data reports. Through this grant, additional assessments, such as the GRADE assessment, were mandated; each of these mandated assessments provide additional data. Not only did the Keystones to Opportunity grant signify a district dedication to the use of assessments and data, but it provided supports for teachers as they used data.

Finally, the district was appropriate for site selection for it was accessible. With any qualitative research, gaining entry to the setting is of utmost importance (Rist, 1982). “It is important to gain access to research or archival sites by seeking the approval of gatekeepers, individuals at the research site that provide access to the site and allow or permit the research to be done” (Creswell, 2009, p. 178). While access may be granted, acquiring the trust and
acceptance of the participants must also be earned (Rist, 1982). Through my experiences at the
district, I developed a rapport with the administrators, teachers, and staff at the school, which
allowed me to observe as an insider.

Purposeful criterion sampling was used to select novice, classroom teachers from each of
the elementary schools in the district to participate in the study. For the purposes of this study,
novice teachers were defined as certified teachers with no more than three years of teaching
experience. Using purposeful sampling, participants were selected for their “information rich”
experiences (Patton, 2002, p. 40). These participants were selected to best help understand the
problem and research question, specifically how novice teachers’ beliefs regarding data-driven
decision making were formed (Creswell, 2009). Novice teachers in the district were identified
through the School Board minutes and were the first, if not only, new hire at their respective
buildings. While Ann had originally been selected for the study when she was initially hired for
a long-term substitute position in the district, she was moved to a permanent position at a
different elementary school and became the selected participant at that school. Through the
selection of novice teachers at each of the elementary schools in the district, the influences of
subjective norms and behavioral control were illuminated.

The four novice teachers, identified by pseudonyms, were Rachel, Carly, Ann, and Joe.
Rachel was a new teacher directly out of her teacher preparation program; she had completed her
student teaching practicum in a kindergarten class in the district the previous year. During the
study, Rachel was working as a long-term substitute for a second grade classroom. At the end of
data collection, Rachel had been hired for a permanent second grade position at another school in
the district. Carly was also working as a long-term substitute for a second grade classroom. She
had been a substitute teacher in the district for a few years and had worked as a long-term
substitute from September to April in a second grade classroom in the same school. At the end of data collection, Carly was no longer in a long-term substitute position. Ann was a new hire for a permanent first grade position. She had taught briefly at a private school before leaving to work in a different field. During the previous school year, Ann had come to the district as a substitute. Ann’s mother had a permanent position in the district teaching the same grade as Ann. Joe was also a permanent, new hire in the district. During the previous year, Joe had spent fifteen weeks in a long-term substitute position before being permanently hired.

Through time in the field and data collection, additional critical participants were identified. Using snowball or chain sampling, the researcher asks participants to identify additional people that may be well-informed about the topic (Patton, 2002). The novices identified the district’s literacy coaches as well-informed regarding the data analysis meetings. The literacy coaches were contacted and provided a copy of the documents teachers were to complete during data analysis meetings, as well as the plan the literacy coaches were to follow when conducting the data-focused meetings. The district’s Director of Elementary Education was interviewed to provide clarification regarding district initiatives.

**Research Strategies/Implementation**

In qualitative research, the research design is responsive to the context. As Creswell (2013) states, “I visualize data collection as a series of interrelated activities aimed at gathering good information to answer emerging research questions” (p. 146). Thus, while the researcher commences the study with specific research questions and data collection methods, the study must remain flexible to emerging issues.

According to Rist (1982), “Gaining entrée, and the conditions under which it is granted, is one of the most critical phases of qualitative research” (p. 442). I began by seeking access to
the district by contacting the superintendent of the district, for he acted as the gatekeeper. The superintendent received an overview of the study and the research questions. Once permission was granted to conduct the study in the district, I began contacting novice teachers to participate in the study. Novice teachers, or newly hired teachers, were identified through the School Board minutes and district communications. The novice teachers were informed of the purposes of the study, the time requirements, and how confidentiality issues were to be handled.

I began by interviewing participants before or immediately following the start of the school year to gather information regarding their initial beliefs and thoughts regarding data analysis. Following the initial interview, I met with each teacher once a month in their classroom or another convenient location to discuss how they viewed data-driven decision making. I met with each teacher three times. Finally, data analysis was used to analyze documentations from the data-analysis meetings and the new teacher induction schedule. Data collection occurred until data saturation was achieved. Rather than the quantity of the data, saturation is the variance and richness of the data (Morse, 1995). Thus, data collection concluded once the theory had been sufficiently developed and no gaps remained.

It is important to note that the researcher is an employed teacher in the selected district. Thus, the researcher approached the study with insider information and biases. Creswell (2013) claims that clarifying researcher biases, past experiences, prejudices, and orientations that may influence the study is important at the onset of the study. Although I am an active participant in the district, during fieldwork I positioned myself between active participant and detached observer (Rist, 1982).
Data Collection Techniques

In qualitative research, the researcher is the chief instrument for data collection and analysis (Owens, 1982). Unlike data collection instruments used in quantitative research, the qualitative researcher is responsive and adaptive to the circumstances and context (Merriam, 1998). Rist (1982) has identified observation, interviewing, and document analysis as primary data collection strategies used in qualitative research.

Semi-structured, or focused, interviews were used to gain individual perspectives from key participants. “The focused interview begins with broad questions and with nondirective responses…, then moves to semi-structured questions, and finally to structured ones” (Krathwohl, 2009, p. 299). Krathwohl (2009) goes on to state that focused interviews are a mix between unstructured and structured interviews, for they combine exploration and structure. “In the broadest sense, to conduct a good interview is to hold an interesting conversation” (Rist, 1982, p. 443). Thus, an interview is a two-way exploration into the participants’ beliefs and ideologies. With the exception of one participant, interviews took place in the teachers’ classrooms. This provided access to applicable documents and materials. Due to one participant’s coaching schedule, interviews were held at the schools where his practices were scheduled. As Krathwohl (2009) points out, “Interviewing in the respondents’ home or office allows them to relax in their own territory, but phone calls and other business may create complications” (p. 301). Thus, interviews were scheduled at a time that was undistruptive as possible and allowed the teacher to focus on the interview. As Creswell (2009) states, information from interviews is recorded by handwritten notes, audiotaping, and videotaping. While all interviews were audio recorded for later transcription, the researcher also took notes to recall gestures and body language.
Document analysis was also included in data collection procedures. “Written material can provide important insights into both public (frontstage) and private (backstage) perceptions, rules, guidelines, and images; and rewards or sanctions” (Rist, 1982, p. 444). As Owens (1982) states, “These materials can help preserve over time some sense of the context in which observations were made and thus aid in recall of events” (p. 15). Documents collected included copies of documents that were to be completed during data analysis meetings, the schedule for the new teacher induction program, and the meeting format the literacy coaches were to follow during data-analysis meetings. These documents highlighted the formal and informal interactions regarding data-driven decision making.

**Data Analysis Strategies**

In qualitative research, data collection and data analysis occur simultaneously. “Rather the entire time the researcher is in the field, there is a constant dialectic between collection and analysis, i.e., a constant assessment of what is known versus what is to be learned” (Rist, 1982, p. 445). As Owens (1982) states,

An important element in the design of naturalistic research is starting with questions of broad scope and proceeding through a conceptual funnel – working with data all the while, ever trying to more fully understand what the data mean – making decisions as to how to check and know to verify as the investigation unfolds. (p. 11)

An essential feature of qualitative research is analyzing data as they are being collected, and then using the subsequent understanding to drive further data collection.

The first step in data analysis was the organization of data. Since this study utilized a specific case design, data was first organized by individual teacher. Each teacher was treated as an individual case study. As Yin (1981) recommended, once the general themes have been
identified for each of the individual cases, cross-case theme analysis occurred to offer
generalizations across cases regarding novice teachers’ beliefs regarding data-driven decision
making. Thus, the data from each teacher was analyzed individually and then cross-case analysis
occurred to identify differences and similarities between teachers.

   Thematic analysis, or the organization of data by key themes, was used to analyze the
data. In data analysis, coding is the first step. According to Creswell (2013), “The process of
coding involves aggregating the text or visual data into small categories of information, seeking
evidence for the code from different databases being used in the study, and then assigning a label
to a code” (p. 184). Creswell (2009) uses codes to identify topics supported by past research,
information that is unexpected or unusual, or information that is related to a larger theoretical
framework in the research. Initial tentative codes for this study were based upon the factors
Ajzen (1991) identified as influencing behavioral intentions, but were broadened as different
themes appeared in the data. Meaningful phrases and segments of text from transcribed
interviews and collected documents were coded and then used to identify themes. “Themes in
qualitative research (also called categories) are broad units of information that consist of several
codes aggregated to form a common idea” (Creswell, 2013, p. 186). These themes provided
insight into the critical factors that influenced novice teachers’ beliefs regarding data-driven
decision making.

   In summary, the collected data was first organized by the individual. Each individual
case was then read multiple times to gain a general understanding of the data. Tentative codes
were then used to identify important and reoccurring points in the data. From the coding, large
themes emerged. These themes were then compared across cases to generalize.
Validity and Reliability

Issues of reliability and validity are common critiques of qualitative research. The nature of qualitative research, especially the emerging design, researcher as data collection instrument, and small sample sizes, have raised concerns from the quantitative field. However, this study implemented procedures to enhance the validity and reliability of the findings.

Triangulation enhanced the credibility of the study. Creswell (2013) explains the process of triangulation as, “…corroborating evidence from different sources to shed light on a theme or perspective” (p. 251) “As themes begin to arise from interviews or documents or observations, they are cross-checked with other sources so as to verify them, to check the accuracy of information, and to test the perceptions of different actors to given events” (Owens, 1982, p. 14-5). As Rist (1982) states, “Juxtaposing what was said with what was done or what was written provides a validity check on the data as well as alternative sources to confirm the analysis” (p. 444). Through the use of triangulation, researchers reduce the risk of single-source support for their findings and the possibility of misinterpretation. “Stated differently, the greater the alternative sources of data employed in the analysis of a setting, the greater the possibilities for accuracy and a holistic presentation (Rist, 1982, p. 444). Triangulation weaved together the data, creating a well-supported, holistic understanding.

Prolonged time in the field also enhanced the credibility of the study. According to Owens (1982), prolonged time in the field “provides for entry into the situation, ‘learning the language,’ and becoming accepted, trusted, and ultimately relatively unnoticed” (p. 14). As a researcher, investing time in the field was critical to overcoming biases and promoting open communication; trust and openness increased with time. Through prolonged time in the field, the researcher moves from biases and early impressions to deep understanding of the
phenomenon (Owens, 1982). For the purposes of this study, the researcher spent six months in the field. To truly experience what it was like to be a novice teacher navigating data-driven decision making, the researcher invested significant amount of time in the field.

Consultations established reliability and validity. Member-checking, or the process of having participants check the accuracy of researcher’s interpretations, was used in the study (Creswell, 2013). Yin (1981) describes member-checking as having the “factual portions of the case studies reviewed by the major informants” (p. 106). According to Owens (1982), “The process of member checks is perhaps the single most important means available to the naturalistic inquirer for establishing the credibility of an inquiry (p. 15). As Creswell (2013) suggests, the analysis of the description and themes, rather than the transcripts, was shared with the participants. Participants were able to evaluate the interpretation of the analysis and provided any missing information. In addition to member-checking, peer consultation was utilized. “Peer consultation provides opportunities while the inquiry is still in progress to check one’s thinking, to raise questions and concerns, and to talk through problems of which the investigator may or may not be aware” (Owens, 1982, p. 15). For the purposes of this study, the researcher met and shared the findings of the study regularly with the dissertation chair.
Chapter 4

Findings

Introduction

Since the introduction of No Child Left Behind, data have been in the educational spotlight. However, data collection neither guarantees data analysis nor improved instruction. Research has shown that, novice teachers while required to use assessment data, generally lack the training and skills necessary to engage in meaningful data-driven decision making. This study explored the dynamic nature of novice teachers’ perceptions and beliefs regarding data-driven decision making. The central research question was: How do novice, elementary teachers perceive their training in and assess the efficacy of data-driven decision making? The subsidiary questions included:

- How do novice teachers describe their pre-service and in-service training involving making data-driven decisions?
- What is the perception of novice teachers on the role of assessment, data analysis, and data-driven decisions in their instructional activities?
- How do principals and colleagues encourage or dissuade novice teachers from engaging in the data-driven decision making process?

The findings indicated that novice teachers’ data use is impeded by a lack of comprehensive training, the perceived divorce between the assessment data and their daily instruction, and the social forces in the school.

Training

Training significantly affects data use. Neither understanding the assessments and the resulting data nor knowing how to read the reports impedes novices from using assessment data.
Consequently, due to their lack of understanding regarding the assessment data, the novices were simply not using the data. In all cases, the participants shared their need for additional training for data use.

The study’s participants (identified by pseudonyms) perceived their pre-service and in-service training as not adequately preparing them for data-driven decision making. The professional development the novices received regarding the assessments they were expected to administer was non-existent or offered too late to be of any true help. Consequently, as a result of their lack of training and knowledge regarding the assessments and the resulting data the novices 1) lacked a clear understanding of the purpose of data use; 2) were unable to interpret the data reports; and 3) used the data inappropriately and superficially.

**Purpose of data use.**

The fact that none of the three novices understood how to use the data was obvious early in the study. At her first interview, Rachel summarized her experiences with data by stating, "For this year, I don't even know what to do... I have no idea [as we reach] that mid-marking period [what] we are supposed to do [to administer the benchmark assessments] or when you do them. I hope somebody will be able to give me some direction on that." At a follow-up interview, when asked what is holding her back from using data more, Rachel responded, "Probably the knowledge about it. I don't really know a lot about it or what I'm supposed to use it for. I would say that probably holds me back quite a bit." When asked what she would need to better utilize the data, Carly quickly declared, "Explanation. As to what the data is. Why do we have it? What are we supposed to do with it?" When asked at her initial interview how she saw herself using data in her classroom, Ann, another novice teacher, shared, "Honestly, I don't know [how to use the data] other than for my interventions and grouping the kids to pull them for what
they need. I need to learn more about how to use the data for other things to be honest." When discussing how he had used data, Joe reflected on his experiences filling in as a long-term substitute for a few weeks the year before and stated, "Last year I didn't because I really didn't know what I was supposed to do with it." While vaguely aware that data were important to the district, all lacked a fundamental understanding of how to effectively utilize assessment results.

Not surprisingly, the teachers' lack of knowledge of the data reports hindered their data-driven decision making. When asked if she talked about her data use with her fellow teachers, Rachel responded, "No. Not until I know more about what I'm even looking at. So, hopefully, next week [after the DIBELS training], they can explain that a little better." Her lack of knowledge caused her to shy away from discussions and decision making that involved data. Ann found herself struggling with knowing that she was required to use the data, yet not knowing how to tackle, as she perceived, this monumental undertaking.

The hard part is that coming up next year we are going to be judged on our data and how we use that data. I'm really going to have a hard time I think because I tried to [use the data] yesterday and I couldn't [actually use the data to] put groups together that made sense. I was looking online as to how other teachers do it. They claim they use the data to [make their groups]. They can't use just all data. I don't believe that for one minute that they just use all data to drive their groups. That's what we are told to do but [we can’t].

To Ann, the purpose of data use was to meet her professional observation requirements and to group students. As a group, the novices shared a very limited understanding as to how data could be meaningfully used.
In-service, data-focused professional development.

According to the novices, training regarding the assessments and consequent data use was non-existent or was otherwise not well matched to their needs. When the novices did receive training, it usually focused on administering the assessments rather than analyzing and using the data from the assessments.

For example, even though the first day of school for the teachers was on August 19, the novices did not receive their DIBELS training until October 23. During this two month period, the novices were expected to attend and meaningfully participate in data analysis meetings. Yet, they were not permitted to assess or progress monitor their students until they had received their formal training. As Ann shared, “Yeah, we have not been trained on DIBELS yet so we were talking about all of this data for DIBELS, when I didn’t even know what it was. I’ve been trying to figure it out a lot on my own.” Without the necessary training to provide the much needed knowledge to utilize the data, Ann felt overwhelmed and unable to contribute to or participate in the conversation. Carly, who had been placed in a long-term substitute position the year before, was absent during her first data analysis meeting that year. When she returned, she was given the materials, yet did not understand what to do with the information she was provided. As Carly shared, “Last year when we did all the data analysis I had the flu…I came back and they had a folder. They were like, ‘Ok, this is your QPS. This is [your other data].’ I was like, ‘I don’t know what it means, but okay.’” Without training and the support of her colleagues to help her decipher the data results, Carly was at a loss as to how to read, interpret, and use the results. Training was necessary to allow the novice teachers to be productive and active participants in the data analysis process.
Although the novices were not officially trained on the DIBELS, the district did have their mentors show them how to assess using the DIBELS assessment. As Rachel shared, “[My mentor] showed me the week before I started how to give the DIBELS test. Now, I’m not allowed to do it until I’m trained on it.” In the two months leading up to her training, Rachel had to rely on one of the school’s learning support teachers to come and progress monitor her students. When asked at our initial interview if she had been trained on DIBELS, Ann shared, Not yet. They told us we would be contacted by one of the literacy coaches to set up our training. We haven't done it. So we did our first grade DIBELS today. The other first grade teacher and I are not trained so we had to have a kindergarten teacher come and do DIBELS. The end of the year kindergarten [DIBELS assessment] is the same as the beginning of the year first grade [DIBELS assessment]… We weren't allowed to test. I got to sit in. Someone came down and covered my class while my mentor teacher let me sit in just to see what they did. But that's all the farther I got. [My mentor] showed me how they add up the scores and all that stuff…So I at least got to see, but I sat in for one child.

While the novices were given the opportunity to watch their mentor administer the benchmark assessment to a few students, they had yet to receive any background information involving the purpose of the DIBELS, its sub-tests, or what the data showed. Despite the fact that they had no real training on DIBELS, the novices were expected to utilize the data to form intervention groups and guide their instruction.

Joe’s experience with DIBELS training was slightly unusual. He had been hired for a long-term substitute position for fifteen weeks at the end of the previous year. When he came into this position in the middle of the year, Joe was expected to begin to assess his students using
the DIBELS assessment. He described his training as “A quick run by. Here’s the book. Read it.” Joe did acknowledge that somebody sat with him when he first began assessing to verify he was administering the assessment correctly. “When I did DIBELS the beginning of this year one of the Title I teachers did sit with me and we both did it. We compared [our results] to see how well I did.” While this method did improve the chance of accurate results, it served more to police than to train. In Joe’s words, “Oh yeah, I mean I had to administer the DIBELS [to monitor students’ progress] every week for [students identified as needing intensive and strategic support] and they were just like here's the book. Have fun!” It wasn’t until the following school year that Joe was approached about DIBELS training.

I am just being trained October 23rd on how to do DIBELs officially. I got a quick run through last year by [the school’s literacy coach], but I am getting the actual training this year… Yeah, [the literacy coach] actually came in my room this morning and she was like, ‘Do you want to do the DIBELS Next?’ and I was like, ‘Sure!’ and she was like, ‘I think you should.’ She's like, ‘So you are officially [trained] and understand everything.’ I was like, ‘Okay. I should have done this last year, but whatever. Sure! Sign me up!’

Joe was in this position for approximately six months before he was offered any detailed training regarding the DIBELS assessment. Yet, despite his lack of training, he was still expected to assess his students, analyze the data, and having meaningful data-based conversations with his colleagues.

When the novices did receive training regarding DIBELS, they perceived it to be unhelpful. Rachel described her DIBELS training as, “We sat there and we'd read a passage. We'd read the instructions and then we'd play with it. And then we'd do somebody else's class.
It was a lot of just [repetition], over and over again. I know how to give it!” She further elaborated on her DIBELS training,

...it was on why we do it and pretty much it's because the district paid for it. Then they explained how to do it and that was the bulk of the presentation. They didn't really talk about what you do with it, other than your grade-level meetings or intervention groups. But no one really went into detail into as to what you do after you have the data. You're supposed to collect it.

Even after her full-day training, Rachel was still unsure how to utilize the data post-collection. While she was instructed on how to give the assessment, she had very little, if any, training on reading and interpreting the findings. Ann described the training’s shortcomings as, “…I just felt as though it could have been more in-depth or given us more hands-on practice. We did one hands-on practice [for each sub-test] and that is it. That is it.” Ann elaborated,

I didn't learn anything new than what I had learned previously by talking to other teachers, by talking to my mom. We did do a couple of things where we got onto the computer and did the scoring. Some of the other teachers agreed that we kind of breezed through the nonsense words, which is the one that a lot of us [believe] is the hardest one to get a handle of… They went fast and they didn't talk about what is considered a whole word. What if the child is quickly moving their lips so fast? Is that a whole word?...So I emailed [the school’s literacy coach] after the training when I went to do my first set of progress monitoring on my own and [asked] what is a whole word? What do you count as a whole word?
Ann perceived the training to be inadequate. It failed to provide her with any additional information, leaving her with only more questions. Even after the training, Ann felt as though she unable to assess her students. When asked to describe the training, Joe stated,

Boring. I walked in and [the presenters asked], ‘Why are you here?’ And I said, ‘Well I need the official DIBELS training.’ They were like, ‘Yeah you've been doing this for a while. Why are you here?’ I said, “Because our lit coach wanted me to come so I can say I'm officially DIBELS Next trained.’

Clearly, the participants perceived the training as inadequate. The novices desired more practice and direction as to how to use the data.

The DIBELS training they attended focused on administering the assessment, while neglecting instructing the novices on how to read and utilize the data. When asked what the focus of the training was, Joe stated, “How to administer it.” When pressed if the presenters taught the novices how to interpret the results, he responded, “No. They just pretty much taught us how to do it.” Carly described her DIBELS training as “just how to give it.” When asked if she had been shown how to use the data, Carly shared, “Not really. They just told us the certain numbers and where to place them and that’s it.” Ann elaborated,

Oh, we didn't talk about what to do with the data afterwards. These are the scores. This is what constitutes a [student requiring] intensive support, strategic support, or a [student that just barely made the benchmark requirements]. The stuff that we already knew from just being here, listening to and talking with other teachers… Yep, nothing beyond what you do with it afterwards… no strategies as to here's how you can help somebody who's lacking in a certain area. Nothing… No. It was just here's the score, they're [identified as needing intensive support] they need [to have their progress monitored] every two weeks.
This full-day training, the only training the novices received for DIBELS, failed to help the teachers engage in data-driven decision making. Clearly, the goal of the meeting, which was held by the district’s literacy coaches, was to have the teachers collect data for the sole purpose of collection.

While their training for DIBELS was offered well into the school year and limited in its scope, the novices received no training on the GRADE assessment. They were neither trained on how to administer the test nor how to read the reports. When asked if they had received training on the GRADE assessment, Rachel responded negatively, Joe replied, “I don’t think that I do,” and Ann stated, “Nope. The only thing that I was given was the manual that I had to read from to give the test and the test booklets for the kids.” The only exception was Carly, who had been placed in a long-term substitute position the previous year when the assessment first came to the district. Thus, she had been included in the half-day training that was offered to all of the teachers in the district. However, Carly perceived the training to be unhelpful. “…[The district’s data liaison] came and was just telling us what all the numbers [mean] and kind of how to read the results.” At a follow-up interview, she elaborated on her GRADE training, “Right. I’ve never been taught how to look at them or even what to do with the information.” Carly explained that when given their reports they were told to not look at the color coding, for the green, yellow, and pink color coding represent something different than the green, yellow, and pink color coding on the DIBELS reports. Carly shared that she had initially panicked when she did not see any green highlighting, which denotes proficient on DIBELS, but exceptional on the GRADE reports. It was not until she was told later that she understood the difference and was able to relax. Without any training, or detailed training in Carly’s case, the novices did not utilize the GRADE data.
The Quick Phonics Screener (QPS) was another assessment screener the novices were expected to administer and utilize when forming intervention groups. However, like the DIBELS and GRADE assessments, the novices did not receive any formal training on this assessment method. When asked if she had received any training on the QPS, Rachel answered, “No formal training. No. It was just this is how you do it and I gave it.” When asked a similar question, Carly shared, “No, because last year they said about the QPS and I didn’t even know what it was. They just came and took my kids and gave them the QPS. Then, that was it.” As the novices’ comments show, they lacked the knowledge of the assessments that make the data both meaningful and useful.

**Superficial data use.**

Due to a lack of training, the novice teachers and their colleagues did not analyze the data deeply. Overall, or composite, scores were used as the basis for decision making without an understanding of the subtest scores or the specific errors made. The data-analysis meetings, a scheduled time for the novices to learn to analyze data with the support of their colleagues, required teachers to look at the composite scores and the color coding on the reports only. As the forms the novices were to complete during these meetings show, the teachers were to form their groups based upon the composite scores, without looking at specific errors.

Due to her lack of training, Rachel relied only on the total numbers and the color coding when forming her intervention groups. Interestingly, not only was Rachel unclear as to what data she was using, but she lacked an understanding of what those numbers meant and why they were to be used for grouping students. When asked to describe the data use at her first data-analysis meeting, Rachel shared, "I'm pretty sure we just used the [Oral Reading Fluency] scores from the DIBELS and then some of the [Quick Phonics Screener] scores for the first part of it."
When asked to elaborate on how the data was used, Rachel responded, "...they said use this column and that's what I used." This issue persisted as Rachel reformed her groups when her colleagues decided to discontinue multi-class groupings for interventions. When asked how she determined which students to work with during her intervention time, Rachel shared, "I looked at the data and then broke down the lowest people out of the benchmark group and they work with me on sight words and stuff like that.” Rachel used the data to identify the lowest students and placed them in her instructional group. As later discussion revealed, Rachel neither looked at the students' specific weaknesses nor deficit skills when grouping the students or determining which skills to teach. Consequently, her intervention group, which was intended to be a small group of students working on a similar, specific weakness, became a grab-bag group of struggling readers with very different instructional needs working on skills that they may not have needed.

At Carly's school, the teachers only looked at the composite, or total, score when forming their instructional groups. According to Carly, her grade-level team never looked at the specific passages to do an error analysis as a way to target specific areas of concern. Notably, how to use the data to drive instruction was never discussed. Moreover, once the students had been placed into groups and a teacher had been assigned to each group, the teachers received no assistance regarding how to use the data to determine their specific instructional approach. As Carly shared, the teachers were only told, "You work on fluency. You work on comprehension." Without a deeper analysis of the data to discover which specific comprehension skills were lacking, the students easily could have been inappropriately placed. Furthermore, although these groups were supposedly data-driven, Carly was never given any data for the students she was assigned to work with during interventions.
While Joe and his colleagues used the final DIBELS scores, they also used the results from the Quick Phonics Screener to provide additional insight. However, like Rachel and Carly, Joe did not look deeply into the data to analyze student's errors, but rather focused on the final scores. During his data analysis meetings, Joe and his team completed the “Data Analysis and Plan for Skill Inventories” form, which only looked at the final scores for each subtest and the composite scores. As Joe shared, “We didn't look at any error analysis. We looked at the scores and then we just went from our DIBELS [data] to our [Quick Phonics Screener data] to see where they were messing up and where they were making their mistakes.” While Joe and his colleagues used the Quick Phonics Screener as a way to more accurately depict their students' reading needs, as Joe noted, they never performed an error analysis of the DIBELS data, the data which had been used to initially form the groups.

Ann had a similar experience regarding data use during her data-analysis meeting. Like Rachel, Ann's meeting required only superficial use of the data. As Ann shared, “…we were just told okay write . . . your kids’ names on this paper and then check off these boxes.” When asked if she had ever looked at the specific errors that her students had made on the DIBELS assessment, Ann responded,

I just go in and look at the score. I didn’t even know that you could go in and look at what mistake they made. [The literacy coach] gives me the papers when she [monitors the students] so I know what they made the mistake on, but if you can [look at their errors] on the computer I don’t know how to do that. I go in to look to see okay they went down…but it was Friday afternoon at 1:30. There’s a good reason for that. Or okay good they went up this time. That’s all I really look at it for. I don’t know what else really to do with it.
While Ann was using the data to quickly monitor her students' progress, she was unaware that she could use the results to pinpoint specific areas of weakness and provide targeted instruction. Moreover, while Ann’s comment shows that she was intuitively aware of measurement error, she lacked the knowledge to effectively express her concerns.

However, DIBELS was not the only assessment whose data were not used properly. Running record data were also used superficially as a quick way to group students. While the forms that Rachel was using to complete the running record encouraged a miscue analysis, Rachel was only using the data to derive an accuracy score for grouping purposes. Consequently, although students may have the same accuracy score, their specific errors and weaknesses may have been quite different. As Rachel explained,

...[the guided reading presenters] went over the reasons why we were using guided reading, not necessarily how to score it. So I talked to [fellow grade-level teachers] and they said to just mark words that [the students] get wrong or words that they skip and base it off of that. So not [looking] so much at errors, meaning, structure, visual that kind of thing (reading off of sample paper). Just if they missed a word, check it and then count up how many [words they missed] and divide it by the number of words on the page and you'll get your percent. So all of my kids fall into a category around 96%. If they could read 96% of what was there, then that's the [reading level] they stuck with.

Carly was also using running record data to group her students for guided reading. Although she had been given the students' levels at the beginning of the year, she did not know how those scores had been derived. She described finding her students' instructional level as, "Then wherever they fell in between the numbers, that is where I placed them." When asked, Carly was neither sure of what these numbers represented nor the specific errors her students had made.
Ann also was told when completing a running record to only mark the words missed, rather than analyzing the cause of the error. As Ann reflected on her pre-service training, she noted that the miscue analysis was very important. "[The running record presenters] didn't show us about that. I remember that was the biggest thing - the syntax, the meaning. You have to look at what their errors are." While running records were introduced as a new data source, the teachers were neither trained nor encouraged to use it to deeply explore a student's reading abilities and needs.

**Interpretation of score reports.**

Reading and interpreting the data reports from the assessments provided yet another obstacle in the novices' quest to use data. Without the necessary training, the novices were unable to interpret either the acronyms or the numbers on the score reports. When asked what she would need more assistance with in order to increase her data usage, Rachel explained, “I would say, knowing what the lines and lines [of numbers] on the DIBELS [score reports] mean and even what all the abbreviations [on the DIBELS score reports] mean. [Also, how] can I use [these assessment scores] in my classroom rather than just [looking at the] numbers.” Borrowing the old adage, it is safe to say that the DIBELS reports were all Greek to Rachel. Ann also had difficulty reading and interpreting her DIBELS reports. She shared,

Yeah, I've already asked my mom [whom is another first grade teacher in the district],

‘What's this stuff…What does that mean?’ I just asked her about the whole composite score and I [wanted to know how that score was derived]. What does that [score] mean? And she was like, ‘We have no idea how they come up with that score.’ It's the [same] big questions for everybody...I didn't feel so bad then when she couldn't answer all of the questions. I haven't even done the training or anything yet. But I'm still trying to

[understand the data] because we had to jump right in...I don't know all of acronyms yet
either. I'm still learning those. Those sheets that we got from the kindergarten teachers had all of the acronyms. I was like, ‘Alright what does this mean? What am I supposed to do with these kids?’

As Ann’s commentary depicted, without an understanding as to how the scores were derived and what the acronyms meant, Ann was unable to answer the basic question: What do I do with this?

Joe also shared that he needed additional help with interpreting the results. While Joe understood the benchmark goals that his students' were aiming for, he was unsure as to how to use the data for anything other than a measuring stick. When asked what he would need in order to more effectively use the data, Joe responded, "Probably somebody to help me interpret it completely to the point where I understand it. I mean, for the most part, I understand the DIBELS and where they are supposed to be and stuff. Maybe a little more explanation on it."

Reiterating this point, Rachel stated, "I don't know if I'm using it the exact [way] or to the fullest that I'm supposed to be using it because nobody's ever really said, ‘This is what you do with it. This is how you use it.’ But it's nice to know where the kids fall in line." Without the knowledge necessary to read the reports, the novices simply used the reports to determine if their students were where they needed to be, as determined by the external benchmark standards. For the novices, the richness of the data reports was reduced to undecipherable acronyms and columns of mere numbers.

However the DIBELS reports are not the only source of confusion for novice teachers. As the novices shared, without any training regarding the GRADE assessment, they were unable to meaningfully read and interpret the GRADE reports. Without the knowledge of the assessment and an understanding of the data it provided, the data reports became merely shelf filler. Rachel articulated her experience with the GRADE assessment as, "Well, the GRADE, I
don't even know what that is. I've never done anything with it. I've never used it. All I know is that if they are in that blue river then they're okay and if they're in the gray boxes then they're okay." When asked if she used the data, she stated,

Nope. I have a packet lying over there of stuff I got back and that's all we did with it....

[My mentor] said send this [score report] home. She said that she hadn't sent hers home yet so I didn't send mine home yet. So, no, I don't know anything about it. When I student taught I watched [my student teaching mentor] give the GRADE. I didn't help with it. I just walked around the room. That was it. So I know nothing about it.

Without any training regarding the GRADE assessment, Rachel’s analysis of the score reports was superficial, focusing on where her students fell on the bell curve rather than meaningfully analyzing their scores for each tested area. Sharing Rachel's mentality, Joe explained his use of the GRADE data, "I've looked at it. . . . but I just kind of put it by the wayside.” While Joe gave the data reports a cursory glance, Carly admitted that she "[hadn't] even looked at the GRADE data." When asked if she had used the GRADE data, Ann simply stated, "No, because I don't know how to read it.” She elaborated,

I have not asked for help with [reading the GRADE reports], because I have been so overwhelmed with everything else. I thought that I didn’t need to be overwhelmed by something else. It would be different if somebody came to me and said, ‘You’re new. Can I help you with this?’ Yes! Fine! Honestly, [the GRADE score report has] gone in my drawer and I haven’t even looked at it other than when I got it back I started looking at it. I don’t know what the scores mean. It makes me feel stupid. It does! It makes me feel stupid that I don’t understand the scoring of these tests.
Lacking the understanding and the skills to read the data reports, the teachers feel "stupid" and quickly hide the signs of their perceived incompetency away in desk drawers or on forgotten shelves.

However, the teachers were required to share the students' GRADE results with their students’ parents. The GRADE program was solely controlled by the district's data liaison. The distribution of the GRADE data was handled solely by the data liaison; the teachers did not have access to the software program and were unable to view the data unless they requested a printed copy of the reports. This separation between the teachers and the data appeared to hinder their use of the GRADE data. These reports could be sent home with the students, included in report cards, or given to parents during parent conferences. This was a source of stress for teachers as they lacked the knowledge to interpret the results themselves. As Joe commented,

…I look at the results and I can't even really interpret [them]. Nobody's told me this is how you interpret this sheet of paper you are sending home. I have had my aunt, when she was looking at my cousin’s scores, ask me, ‘What do you [see] here? How do you [read] this?’ I'm like, ‘Look at what it says. I don't know.’

As Ann confided, "I'm going to give [my students' GRADE reports] out at parent conferences and I hope they don't ask me what it means because I don't know." Similarly, Carly joked that she was quickly going to show the parents the reports during parent conferences, but then move on without explaining the reports; she was unable to answer their questions, for she couldn’t interpret the reports.
Pre-service.

The novices’ lack of understanding regarding the data-driven decision making process was compounded by the absence of discussions regarding assessments and data during their pre-service training. None of the participants had been introduced to any of the assessments that the district utilized. When asked if she had learned about data use during her teacher education program, Carly responded, “Not really. Not that I can remember.” Joe responded, “Not any of the tests that we use. I’m trying to think of any of the tests they even talked about, but it was nothing like GRADE or DIBELS.” While Joe’s teacher education program did discuss some assessments, none of the assessments used by the district in which he currently taught were touched upon. Thus, Joe felt unprepared for the using the district’s assessments. As Joe exclaimed, “I didn’t even know DIBELS existed!” However, once in the classroom, DIBELS would be used not only to guide his instructional decisions, but to evaluate his instructional performance. This assessment-driven approach stood in stark contrast to the expectations of his teacher education program. He described his teacher preparation classes as, “[They certainly did not tell us] you are going to test your kids for the first three weeks of school and try to collect [data]. NO! [Don’t teach] like that!” When asked to describe her experiences with data use during her teacher education program, Rachel responded, 

In my pre-service we pretty much just did projects in class. So we didn't really do a lot with data. We talked about it a little bit, but they never explained these are the types of data you will find and this is what is used in classrooms right now. I found my pre-service to be pretty pointless.

Rachel perceived her teacher education classes as being inadequate in preparing her for a future career. In addition, Rachel found her pre-service practicum, which she completed in a
kindergarten classroom in the district, to be unhelpful in regards to data use. While she watched her student teaching mentor administer the assessment, she was never told why the assessment was given or what it showed. Thus, when asked during an interview to share what she knew about testing and data, Rachel was unable to articulate what the data could be used for.

I don't know really what data there is. In [my kindergarten student teaching placement] we did the GRADE and the end-of-the-year DIBELS and monitored the students’ progress, but I didn't do a lot with it. So I don't know what [the tests] show. I did help group kids for interventions, but I didn't use their data. I used what we had seen and what the group had done in the past. So I think learning the data and learning how to use it will be beneficial, but up until this point I haven't had to use it or know what it is about…In my interview with [the school principal] he asked what I knew about testing and I said well I know what the DIBELS is and what [the students] are supposed to do. I’m not really sure what I do with [the data]. So I mean up until this point there hasn’t been this is what the DIBELS is, and this is how we use it, this is how you are going to use it. None of that… I watched what [my student teaching mentor] did but I didn't actually ever do it. So I had an idea about it, but I never knew what it was for, what they did with it, or how to do it myself.

While Rachel had a unique opportunity to student teach in the district in which she was later hired, the experience was not beneficial in regards to data. Her experiences were limited to watching the assessments being given, yet never engaged in the data-driven decision making process. For the novices, their teacher preparation programs, by providing aspiring educators with a different approach to teaching, failed to provide them for the demands they faced while in the classroom.
Assessment and Instruction

All four participants perceived a lack of congruity between the assessment data and their instruction. The novices perceived that in their estimation, 1) the assessment data did not accurately portray their students’ actual achievement; 2) the assessments, such as the DIBELS benchmark assessment and the running record assessments, did not align with their classroom instruction; 3) there was a discrepancy between the data derived from the varying assessments and screeners; 4) the administration of the assessments affected the data results; 5) their observations were a better indication of their students’ abilities than the assessment data. Consequently, assessment and instruction were viewed as two separate entities and had minimal connection to each other. As a result, the novices viewed their observations as a more accurate indicator of their students’ abilities than the assessment data.

Dissonance between assessment data and student achievement.

Throughout the study, the participants repeatedly cited concerns regarding the discrepancy between the students’ assessment data scores and their actual achievement in the classroom. The novice teachers noted that the test data often appeared to misrepresent students’ actual abilities, resulting in inappropriate instructional placements. Consequently, the teachers worried that when they relied on data, instructional time was misused and their struggling students were not receiving the intensive support that they truly required. For example, both Joe and Ann shared stories regarding a student in their respective classrooms that met the beginning of the year benchmark goals, as determined by the DIBELS assessment. Yet, when the novices began working with these students, they quickly realized that the DIBELS assessment had grossly misrepresented these children’s abilities; these students were actually in need of intensive
remediation. When asked if he thought the data were an accurate indicator of his students’ achievement in the classroom, Joe explained the discrepancy:

Some cases yes, other cases no. For instance, I had a little boy who at the beginning of the year met the DIBELS benchmark requirements and at that data analysis we went through I said he met the benchmark requirements. I mean he is not identified as in need of strategic assistance. He met the benchmark requirements on all the sub-tests. So we placed him in, what I felt and the other [Federal Programs] staff felt was the appropriate group. Well, as small groups started, I noticed that he wasn't quite meeting the benchmark goals. Somehow he [had appeared to have met the benchmark goals at the beginning of the year] but he wasn't. So we moved him back a group. And then after working with the [Federal Programs] teacher, we realized that he was even farther behind yet and we've noticed that he is probably the lowest kid in my class…So for that kid it did him a disservice because his data said he met the beginning of the year DIBELS benchmark goals, but if you look at everything else he's one of the bottom kids.

Joe continued by saying, “Yeah, like the Quick Phonics Screener and the DIBELS said he should be in this group. Technically, no. He should have been in a letter naming, letter sounds group.”

By using the assessment data as the determinate of this students’ placement, Joe said it took approximately a month to correctly identify, by trial and error, the group that most appropriately met this child’s needs. The assessment data provided a gross misrepresentation of the students’ actual achievement. Due to the reliance on the data to describe a students’ ability, Joe’s student spent a month of valuable instructional time in an inappropriate instructional setting. It was only through teacher observations in the intervention groups that the discrepancy was discovered and corrected.
Ann shared a similar story regarding her students. Ann’s narrative highlighted her frustration with using data that she felt were not a true indicator of her students’ abilities. In her experiences, the assessment data, when used in isolation, had caused some students to be placed inappropriately; she worried that she was not doing enough to support her struggling readers.

We mostly looked at the composite score which is where my confusion and questions lie. I’m still having difficulty with that now because I have kids who are benchmarked who I have no idea on that day how they got a composite benchmark score because they are very low. I have kids who don’t know letter sounds, but have a benchmark score. So right now I’m noticing these kids sliding backwards because they’re not getting the support that they really need. They’re getting the support that a child who reached the DIBELS benchmark goals gets because that’s what their score was. [My fellow grade-level teacher] and I kept trying to get at just because their score is this [why are they in this group when] we’ve been working with these kids for a few weeks already and we know that they are not there. They need to be put in a lower group. We have kids who are in higher groups that should not [really] be in higher groups, but that is where their composite score said they should be placed. And I’m seeing these kids backslide because they’re not getting the support they need and that worries me.

Consequently, Ann confided that she had stopped using data when making instructional decisions, relying now on her own observations and knowledge of her students.

I did use the data at first until I realized these kids are not where they are supposed to be…and I switched them around until now when I finally have them [placed correctly]. I have a little girl who her composite score identified her as needing intensive support. She does not need intensive remediation. She can read. She does not do well with nonsense
words and then she gets frustrated and shuts down and stops. That’s why her score identified her as in need of intensive support, but just because she has a score in the intensive range does not mean she needs to be in my lowest group.

At a follow-up interview, Ann once again expressed her frustration regarding inaccurate benchmark assessment results.

It really just gets me flustered. I honest to goodness spent most of the day yesterday trying to figure out these groups and I was trying to do it based on the data. And I was coming up lost because I can't group somebody who I know is a reader, but just because they are scoring at the lowest guided reading level on this one minute running record assessment, I can't put them in my lowest group. I have to just go based on my better judgments and my observation.

Ann used these narratives to clearly indicate how the assessment results did not accurately identify the students’ achievement. This perceived inaccuracy caused her to discredit the data. Even though she felt as though she should use data to form her instructional groups, she grew frustrated and discouraged at the prospect of using data, which did not coincide with her students’ actual performance in the classroom.

Part of the issue appeared to be that the novices perceived that the assessment paragraphs varied significantly in difficulty. This appeared to be especially problematic with the use of the passages to monitor students’ progress between benchmark periods. The novices reported that their students’ progress would fluctuate significantly from week to week, with scores increasing one week only to decline considerably the following week. The novices agreed that the fluctuating difficulty of the passages was the cause of their students’ roller-coaster-like scores.
When looking at her student’s DIBELS nonsense word fluency progress scores, Ann noticed that her students’ scores were varying drastically.

I would look at the kids’ scores and see they got 35 sounds last week [when reading nonsense words]. This week they went down to 15 [correct sounds read]…[The literacy coach] said, “Oh, this week was really hard.” Why do that? So how can we really, truly get a picture of where they need to be intervention wise if one week they have a million sounds and the next week they're back down because [the passage is] hard, because it's difficult.

Even though the data were collected to monitor the students’ progress, the novices deemed it useless because the difficulty of the probes varied creating a false picture of the students’ current academic performance. The novices perceived the assessment data as invalid and as such, they did not accurately represent their students’ performance.

**Alignment between assessments and instruction.**

A prominent concern for all the novice teachers regarded the validity of the assessment data and the perceived disconnect between these data and their actual classroom instruction. In point of fact, the data from the assessments were designed to measure students’ performance in skills that were not prominent in any of these novices’ daily classroom instruction. The novices perceived the assessment’s emphasis on fluency and reading nonsense words as clashing with their instructional focus of comprehension and developing word attack skills when reading real words in context. Consequently, the assessment data were not utilized, for it measured skills that were of distinctly lesser importance to the novices. For example, Joe expressed concern that the DIBELS assessment focused on how many words students could read in a minute, while essentially ignoring their ability to comprehend.
And the bad thing is they have only been looking at one number [that only shows] how many words per minute they read and they are not looking at the students’ ability to comprehend. [Rather] can we just get them to 47 words per minute by the end of the school year? What about the comprehension? The students do not comprehend what they are reading.

Joe perceived students’ comprehension to be of greater importance than how fast they could read. In his classroom, he was focused on comprehension and making sense of what was read. Joe questioned the efficacy of data that did not match his belief of what constituted reading. Thus, to Joe the data were not an accurate indicator of a student’s ability to read and were not used when he planned his instruction.

In addition to concerns regarding an emphasis on fluency at the expense of comprehension, the two first grade teachers perceived the nonsense word fluency probe in the DIBELS assessment to be useless. As Ann stated,

To be honest, I don't really care if a kid can read a nonsense word. I would rather have them read real consonant-vowel-consonant words in context. I mean that's how I look at it. Why can't they just read real words? Why can't they just read whole words? You know, practice reading whole words that are real words? Sure! I can understand that.

Ann’s daily instruction focused on helping her first graders read real words in context. On the other hand, the DIBELS data measured a skill that was in marked contrast to her instructional focus. Joe expressed similar concerns regarding the nonsense word fluency probe on the DIBELS assessment. In Joe’s daily instruction, he encouraged his students to break apart unknown words and use their word attack skills. However, on the nonsense word fluency probe, if the student broke the word apart when reading it, it did not qualify as a whole word read. As a
result, the students’ use of the reading strategies Joe taught to his students negatively impacted his students’ scores on the DIBELS. Consequently, Joe viewed the data as an invalid indicator of his students’ learning.

Carly also expressed concerns regarding the data and the instruction. Carly had the learning support inclusion classroom, which consisted of the two identified learning support students in her grade-level and seven students that were expected to qualify for learning support in the near future. Due to the students’ low DIBELS scores on the beginning of the year benchmark assessment, Carly was told to monitor the progress of her low-scoring second students using the first grade assessment materials. As Carly said,

I have nine students whose progress is being monitored at the first grade level. And yet when they take the middle of the year DIBELS benchmark assessment, they are going to be tested using second grade materials. It just doesn't make sense to me why you would do that.

Carly perceived a lack of congruity between the progress monitoring through the benchmark assessment and her daily instruction. By using first-grade materials to monitor the progress these students were making in second grade, Carly believed that she would not be able to truly determine the progress these students were making in second grade.

Overall, the novice teachers perceived the data from these assessments to be out of sync with their understandings of reading performance, and consequently, the skills and strategies they taught their students. While the teachers were concerned with their students’ abilities to read real words in context and to understand what they had read, the assessment emphasized reading lists of nonsense words and fluency.
Data results variability.

With its focus on data-driven instruction, the district had adopted numerous assessments to provide a comprehensive picture of each student. However, with mounds of data that painted very different pictures of the students, the novices were left wondering which data to use and which to discredit. Primarily, the participants found discrepancies between the running record data and the DIBELS data. The two assessments, both designed to determine students’ reading ability, as determined by fluency and accuracy, and minimally comprehension, identified differing levels of needed support for the same student. Consequently, students who had been identified as intensive on the DIBELS assessment may not have been in the lowest, or intensive, reading levels according to the running record assessments. With the district’s mandate that the teachers were to meet with their students identified as intensive in a small group setting daily, the teachers were left wondering which data to recognize as the true indication and basis for their instructional grouping. For example, Rachel shared,

We're supposed to do guided reading every day, at least three [groups] a day. So you have to meet with your [group in need of intensive support] every day. But that could mean two very different things because your [students identified as in need of intensive support] in DIBELS might not be [the students identified as in need of intensive support] in guided reading because some of them might not match up.

Ann shared Rachel’s concerns.

So it's kind of confusing as to what is going on or what they want exactly. With all this data and stuff I'm so confused because they want us to look at DIBELS data. They want us to look at levels for the running records. None of that stuff ever matches. That's what the hard thing is. They want us to move kids based on DIBELS data. That's fine but they
also want us to incorporate the leveled reading. I have so many kids who are reading ninety sounds and twenty-eight, thirty whole words, but are still reading at a level A in Reading A-Z. What do you do with those kids? That's what I don't get.

At a follow-up interview, Ann stated,

It's not matching up and you can't just look at data to put the kids in a group. Here's the thing: I understand if they want us to just look at DIBELS data to group the kids for interventions. That’s great, but tells us that. Don’t try to incorporate all of this other data that's not matching up to tell us where to put the kids. I can understand if a child is reading many whole words, [you] don't put them in a whole word group, but they're telling us to use all different kinds of data that aren't matching.

The data from the different assessments created confusion in the schools. Left with wildly different results, the teachers were left questioning the validity of both assessments and the ability of either of the assessments to truly capture a student’s instructional needs.

**Relationship between assessment administration and results.**

All of the novice teachers noted that the manner in which the assessments were administered was another factor influencing the usefulness of the assessments. While they had an intuitive understanding of measurement error, they lacked the training to express these concerns with the correct terminology. The location in which the assessments were given, the time of day the assessments were given, and the proctors administering the assessment were all cited as factors affecting students’ performance. The teachers were required to monitor their students’ progress following the schedule developed by the district. Using the students’ scores from the beginning of the year DIBELS benchmark, the schedule dictated how often and when each student should be monitored. This meant that some weeks, based upon the make-up of the
class, the novices had numerous students to assess and on other weeks they may not have been required to formally assess any of their students. In order to complete the progress monitoring, the novices said they used their class computer time or found small blocks of time throughout their day to administer the DIBELS progress monitoring assessment to individual students.

Rachel perceived the setting of the assessment as directly influencing her students’ performance. 

What can you really get? We do it in the computer lab so really [the students] want to play on the computer. They don't want to [read the assessment passage]. Or you do it in [the classroom] and everyone else is talking and they want to do what those people are doing. So it's not a true test of what they know.

She perceived the setting, including the distractions and the promise of more desirable activities, as a factor influencing the validity of the data. While progress monitoring the students in a quiet, private setting would be desirable, the time and resources were simply not available. Along with the location of the assessment, Ann perceived the time of day the assessment was given as also influencing the data. “… but I go in to look to see [my students’ results]. Okay, they went down . . . but it was Friday afternoon at 1:30. There’s a good reason for that.” As Ann noted, the data from assessments that were given when the students were tired, hot, and preparing for recess does not accurately portray the students’ abilities. Consequently, these data were largely discredited and not used for instructional purposes.

The novices also viewed the stress of being constantly assessed as having a negative impact on the resulting data. They perceived that isolating and timing the students caused anxiety, which hindered the students’ performance. In addition, when the students made an error during the DIBELS assessment, the teacher clicked on the incorrect word to mark it as an error. This instant acknowledgement of a mistake was also viewed as negatively affecting students’
performance. When asked if she viewed the data as being an accurate indicator of her students’ abilities, Rachel responded:

I wouldn't say a hundred percent. Maybe like seventy-five. I think distractions and that sort of thing play a big part in it and I think that just nerves play a big part in it. When they are sitting there, they know they only have one minute and every time I click the mouse something went wrong. So I think that it is not a true indicator of what they can do. I think it is a little bit, but I think just being in the classroom is a much higher indicator of what their abilities are versus sitting down and doing [the assessment] on the computer.

Nerves can affect performance. The novices perceived the assessment as a stressful event for students; thus, the students’ performance was hindered and the data were perceived as invalid. While the teachers were responsible for the beginning and middle-of-the-year benchmark DIBELS assessments and weekly progress monitoring, not all of the participants were trained in DIBELS and were not able to administer the tests. As a result other teachers tested the novices’ students until they had been officially trained. As Carly noted, the experience of reading with an unfamiliar person likely had a negative effect on the results of some students. By having outside proctors, the comfort, support, and familiarity of a well-known teacher were removed, increasing students’ anxiety. As Carly shared, “I also don't like that other people are testing them, because I know some kids who when they are in front of someone else they just like freeze. They won't read. And I don't agree with the results so much.” The assessment was made even more stressful when a third party administered the assessment to the students. Once again, the students’ anxiety negatively impacted their performance. Consequently, the data were deemed invalid by the novices and promptly discredited.
For all four participants, the questionable validity of the data deterred them from meaningfully using it to engage in data-driven decision making to inform their daily instruction. The novices perceived the data as not accurately portraying their students’ abilities, due to factors including incongruity between the assessment and the classroom instruction, discrepancies between data sources, and assessment administration. As Ann succinctly stated, “…I just feel that if it were more valid, if it gave me a more accurate picture of what I knew of the child, sure I'd be more than happy to use it. I think the validity of it has a lot to do with it…” When deciding to use data, novices must perceive the data as being a valid indicator of their students’ abilities.

Superiority of teacher observation as an indicator of student learning.

Perhaps due to their concerns regarding the validity of the assessment data, novice teachers perceived their observations as a more accurate indicator of their students’ learning than the assessment data. Consequently, novice teachers used their observations as a basis for student grouping and instructional changes, rather than the provided assessment data. All four participants perceived their personal observations and knowledge of their students as the keystone for their instruction. As Ann stated, “To be honest, I do more observational grouping than I do using the data.” When asked if she changes her instruction based upon the data results, Carly replied,

… I change my groups for guided reading based on how [I feel] they are doing on running records or just reading with them one-on-one -- not necessarily [based on the data]. If I notice that a student is having trouble with something that we are doing in class or whatever I will repeat it or pull them aside and work with them one-on-one, but I wouldn't necessarily change it. Probably should.
Even though Carly openly acknowledged that she should, based upon the district’s expectations, base her instructional decisions on the data, she used the knowledge that she gained by observing and working closely with the child.

Despite the fact that the novice teachers readily used observations to guide their instruction and form their groups, the participants shared that they utilized the data to form their initial groups. However, after working with the students, the teachers used their observations to more appropriately group the students. Ann shared, “I did use the data at first until I realized these kids are not where they are supposed to be and I switched them around…” Ann willingly used the data to form her groups, until she realized that her observations were more accurate. At Joe’s school, he and his grade-level team experienced a similar situation. Joe shared, “Initially data [are used to group the students]. Then as the year goes it's teacher observation.”

All four participants strongly believed that their observations, based upon the time they spent closely working with their students were superior to the assessment data. Ann perceived the data to be invalid and unable to comprehensively depict a child. As she explained,

I don't base my guided reading groups on my DIBELS scores because we're not reading nonsense words. We're not segmenting phonemes. We are reading whole words. We are reading high frequency words. We are reading decodable words. Well, I say I [form my instructional groups] based on my running records, but essentially I don't. I do it based on my classroom observations, what I know about the kids, what I know about their comprehension skills, what I know about their word attack skills, and if they know their high frequency words. I just changed my groups. I made my groups new again for the third time this year. So I do move them around because you do notice some kids
needing some extra help but I can't say I look at my running records and say oh these kids need to be grouped together.

Ann argued that her observations were a better indicator of her students’ abilities. To Joe, the time he spent working closely with these students was a better indicator of their ability than a one-minute assessment. As evidenced by his following statements, Joe felt that the initial student groupings based upon data were a crutch that he no longer needed now that he knew his students. “I am seeing those kids every day. I am seeing them twice a day because we are doing interventions and I see them in small group. I am able to see them for a half hour a day, some of them individually, and I can see where they are going.” At a follow-up interview, Joe reiterated why he used observations to group his students. “I mean I feel that I know my kids pretty well now that I've been working with them in small group every day. I feel that if I had to regroup them right now I could regroup them. I wouldn't use data.” In Rachel’s opinion, her observations matched what the students were actually learning in her classroom.

I would probably use more of the observations. Only because I think that shows me what the kids actually know and what they don't know out of what we're doing rather than just reading a passage and whether they can retell it or not. So I think I would use what I see in the classroom versus what we do in DIBELS.

These examples highlighted that novices viewed the data as a way to initially group unfamiliar students. Once the teachers got to know their students and understand the curricular expectations, they no longer needed the data as support.

Notably, the novice teachers cited examples of their co-workers also moving away from data use, focusing more on their personal observations when making instructional changes, as the year progressed. Ann explained,
I know that here in first grade we do a lot of the observational [groupings]. The other novice first grade teacher and I just changed our intervention groups again. We didn’t do any assessment to decide we need to switch these groups. We just knew…we had such a mixed bag of kids in that group so we decided to pick out the highest kids and she has the highest kids in that group and I took the lower kids in that group. We didn’t take a test or have a piece of paper that has data written on it to explain why. We just knew that those kids were struggling and other kids were going farther. You just know that sort of thing.

While the teachers were meeting to discuss their students’ progress and share their observations, the use of data was noticeably missing. Joe, while attending his bi-weekly literacy meetings, found that his team rarely discussed data. In his words, “It is more observation. ‘This is what I’m seeing.’” Even though these meetings were intended to be data-based, Joe and his team recognized that their professional opinions were a better indicator of the students’ abilities. As Ann began to use her observations as a basis for their instructional decisions, she believed that her colleagues were doing the same. According to Ann, “But I honestly feel that I use my observations more than anything and I think that is what most teachers do.” Even though they initially felt pressure to use the assessment data for data-driven decision making, they quickly embraced their professional intuition. As Ann shared, “It's just your intuition. You just know.”

Perhaps as a reaction to their validity concerns, observing colleagues, or simply a lack of knowledge pertaining to the data, the novice teachers quickly moved away from data-based decision making utilizing assessment data. As the teachers developed their professional identities and began to observe their colleagues, the use of the data waned. In the process the data became something to collect rather than something used.
The Social Organization of the School and Lack of Support for Data-Driven Decision Making

Several social structures and pressures in the school served to actively discourage the novices from engaging in data-driven decision making. The novices perceived, 1) their principals as managing data practices rather than actively leading; 2) their colleagues as unwilling to freely offer support for data use; 3) the mentoring program as inadequately addressing their data needs; 4) the general culture of the school as discouraging data use; and 5) the district’s expectations as being a significant influence on teachers’ data practices. While data collection was mandated, meaningful activities and exchanges which would have promoted data-driven decision making as well simply did not occur.

**Principals as managers of data practice.**

The principals did not significantly encourage data use in their schools. While the principals were often present during the schedule data-analysis times, their roles were often focused on managerial rather than instructional tasks.

The participants perceived any data-driven directives as originating from upper administration; their principals were merely relaying the information. When discussing the running record requirements, Carly was asked if she believed the new requirements originated from her principal. She replied, "I'm thinking higher up because [the school's literacy coach] said that they haven't gotten the official word on when it is starting." Based on my experiences in the district, the district's literacy coaches report to the Director of Federal Programs and often serve as liaisons between central administration and the teachers. By indicating that the literacy coach had not been told, Carly implied that the directives were coming from the Director of Federal Programs rather than through the principals. Joe also perceived the running record
requirements as originating from central administration. He perceived his principal as being pressured to require running records. The Title I staff, which are under the direction of the Director of Federal Programs, were also encouraging the teachers to complete running records. As Joe stated,

[The requirements are coming from] our Title staff and pretty much from the top [down] that's what we learned from our in-service training. So [the central administration] kept pushing it down and [the principal] wanted it and then the Title said here's your running records. I mean they created a book and everything for us, but now we just have to find the time to do it...It definitely came from the top down.

Interestingly, even when directives to use data came directly from the principal, such as in an email, the novices still perceived the principals as merely messengers. As Ann stated,

[My principal's] the one that tells us to use it. That's where I get confused because some days, I feel like he's taught before he knows, but it's coming from above, you know, from up above him so he has to push it on us. I don't think that he is so data-driven. I don't think he is looking at the numbers exactly and saying, ‘Well she's not doing her job because her numbers aren't showing [student progress].’ You know, he understands that we have kids who are never going to benchmark. He understands that just as much as we do.

Ann perceived her principal as understanding, yet under the duress of central administration. She did not view her principal as data-driven, yet he was forced to mediate the demands of central administration with the reality of the classroom. When discussing an email that came from her principal instructing teachers to bring data and their instructional manuals to grade level meetings, Rachel felt the original message had come from central administration. She stated, "I
would say that probably came from [the Director of Federal Programs].” None of the participants perceived their principals to be actively involved in determining how data were to be used in their individual schools.

The principals' participation in the data analysis meetings varied significantly. While some principals attended the whole session, others were in and out. While all of the principals were in attendance for at least part of the data-analysis meetings, they were not active participants in the data-driven decision making process. Rather than assuming the role of instructional leader during these meetings, the principals were managers, acting as referee and facilitator. Carly's principal took a minimal role in her grade level's data-analysis meeting. Interestingly, when asked who participated in the data-analysis meetings, Carly listed the members, but left out the principal. It was not until later in the interview when she was directly asked if the principal had attended the meeting that she confirmed that he had been in attendance. Thus, it can be assumed that the principal had neither played a significant nor memorable role in the meeting. When asked to describe her principal's role in the data-analysis meeting, Carly shared that her principal had been in and out of the meeting. He opened the meeting by taking each class list, selecting one student at random, and asking the teacher what that student had achieved in reading so far this year. The teachers responded with personal observations rather than data-based evidence. Ann described her principal's role in the data-analysis meeting as passive. When asked to describe her principal's participation, Ann shared, “He was there the whole time. Am I allowed to say nothing? Is that bad? He was just there and observed. He didn’t really step in to help. He did take notes about our goals because he had to present it to the [school] board that week or that night.” While Ann’s principal was in attendance, he was not actively involved in the process. His note taking was motivated by his upcoming presentation to
the school board, rather than a genuine interest in the data-driven decision making process. When asked about her principal's participation in the data analysis meeting, Rachel responded, “He just pretty much watched…I wouldn't say he took a huge role in the meeting.” Rachel's principal was not a major contributor to the meeting; in her opinion, he would participate only to end disagreements. Similarly, Joe defined his principal's role in the data-analysis meeting as one of referee. Joe shared,

[The principal] was there most of the day. He wasn't there when we were raiding the [Title I room for materials], but he was there for the biggest part. He kind of played referee. At times there were disagreements between the Title staff and teachers and lit coaches. He played referee.

While the principal stayed for the data-based conversations, Joe did not share that the principal assumed an active role as participant. Rather, as Joe's comments suggest, the principal was in attendance to guarantee that the meeting ran smoothly.

While the principals' roles were fairly similar for the data-analysis meetings, their participation in the grade-level meetings varied significantly. One principal, who was in charge of two of the elementary schools in the study, neither scheduled nor attended the grade-level meetings. At the one school, the meetings were sporadic at best. At one interview in December, Rachel shared that her grade-level team had only met twice for their bi-weekly grade-level meetings and the principal had not attended either of the meetings. While this principal's other school met more frequently, the meetings were under the direction of the literacy coach; the principal did not attend these meetings either. At Carly's school, which was much larger, the meetings were scheduled school-wide. Kindergarten and first grade met on Mondays, while second and third grades met on Tuesdays. While the meetings were run by the literacy coaches
and the Title staff, they began with a word from the principal and then the teachers met in smaller groups. Carly described her principal's participation in this way:

[He comes] unless he has something in the office or something else and he can't [attend the meeting]. He's usually there for at least the beginning part to get us broken up into our groups. He usually reminds us what form [number] we are on for progress monitoring… [He checks to see who is monitoring their students’ progress] because he will occasionally say, ‘Well, I can see this person skipped a week of progress monitoring.’ Now he will randomly pull off a couple of different kids' scores on the DIBELS website. Then he'll say, ‘Okay who has this kid?’ Somebody will say blah, blah. And he'll say, ‘Okay I see that he got this [score] at the beginning of the year. Now he is reading thirty-eight words per minute. Can you tell in class if he is getting better or do you have any reasons why he is getting better? Is he practicing more at home?’ So he does do stuff like that. But it is random with random kids and random teachers.

While Carly's principal demonstrated that he was looking at the data, the discussions were not particularly data-driven. Carly also shared that her principal looked at each teachers' progress monitoring. As Carly stated, "[He checks to see who is monitoring their students’ progress] because he will occasionally say, ‘Well, I can see this person skipped a week of progress monitoring.’” While Carly's principal was reviewing the data, the conversations were approached from a managerial perspective, rather than that of an instructional leader. Joe also worked at a larger elementary school. His principal scheduled and ran the bi-weekly literacy meetings. When asked to describe his school's literacy meetings, Joe shared, "[The principal] kind of runs the meetings and [the Title staff is] there and all the first grade teachers…We meet every other Wednesday." When asked to elaborate on his principal's role at these meetings, Joe
explained, “[The principal’s] more of the facilitator. He gets it going. He'll ask us how small
groups are going and what are we doing for small groups. Are we getting our centers done? Are
we doing the whole Daily 5 [scheduling plan for guided reading]?” While Joe’s principal
attended and ran the meeting, according to Joe, the principal used the meeting as a way to verify
that the teachers were following the district mandates. Thus, the principal’s role was reduced
from instructional leader to policeman.

The novices perceived the principals' role as moderator and police. While the principals
were present for the discussions, they were not actively engaged in the data-driven decision
making process. Consequently, the novices did not view their school leaders as models or even
true supporters of data use. The principals were merely serving the purposes of central
administration without a true dedication or concern for data use. To the novices, the principals’
attendance at the data meetings was merely a requirement of their position. When asked if she
would seek assistance with data-driven decision making from her principal, Carly responded,
"Yeah, if I would go to him [he would help]. I just feel like he has so many others issues down
there. We just try to leave him alone." As the novice teachers' statements show, the principals'
actions have failed to establish a data culture where the principal is a data leader in the school.

Colleagues’ influence on novices’ data use.

Throughout the study, the novices perceived a lack of meaningful, specific guidance from
their colleagues regarding their assessment data and the data-driven decision-making process.
When the novices received guidance from their colleagues and mentors, it was general and often
offered too late to be of use.

As discussed previously, the data-analysis meetings were held at the beginning of the
year, immediately following the benchmark assessments. Despite the fact that their training on
the assessments and the generated data reports would not be held for another month, the novice teachers were expected to attend and participate in these meetings. Not only did the first-year teachers not understand the data they were to use, they received no guidance or explanation as to the purpose or the procedures followed during the meeting prior to attendance. Ann described her first data analysis meeting as, “At first I was just trying to feel the ropes because I didn’t know what to expect. I went into it kind of blind and that’s how I felt.” In regards to her first data-analysis meeting, Rachel shared, “I was a little overwhelmed, but they all seemed to be [overwhelmed, too]. They showed me what to do and [the Title I reading specialist] would be like, ‘Okay, well you need to put this person here’ and so somebody helped me.” When asked if anybody had told her what to expect prior to the meeting, Rachel responded, “[My mentor] just said to bring all of your papers.” Ann shared a similar story regarding her initial data-analysis meeting:

It went pretty well. [My other novice colleague] and I were frustrated because we’re new and they didn’t really stop to explain this is why [we do this] or what this is. They just kind of went through their normal routine like everybody knew what they were doing and [my other novice colleague] and I were kind of confused. So it was just a little bit frustrating…We were given everything at the meeting as we went. The other [veteran] first grade teacher filled hers out real fast and [my other novice colleague] and I were just looking at each other. We would have to keep asking, ‘What are we supposed to do on this paper? Can you explain to us what the point is?’ We were just told, ‘Okay write your kids on this paper…then check off these boxes.’ Okay, but what am I checking off? I don’t understand. [The literacy coach] did eventually stop then once we asked. I thought going into it, especially, with two new teachers and [the Federal Programs teacher] is
new...so I thought they would have kind of slowed it down. For lack of a better word, dummied it down for us. It was frustrating because we still haven’t had our training yet and we were talking about all of this stuff.

As these narratives show, the novices were expected to participate in meetings, which they were not fully prepared to participate. The lack of guidance and support from their colleagues led to feelings of frustration and of being overwhelmed.

The novices perceived the lack of support to extend to all aspects of data use. As their stories depict, they received very little, if any, guidance regarding which assessments to give and how to use the data. When asked if anybody had talked to him about using the data, Joe replied, “Me personally? No, not really.” Joe’s experiences closely matched those of his novice colleagues at all schools. The novices perceived their training as inadequate and the required support as minimal. In Rachel’s case, she perceived her training regarding running records, a new type of assessment required this year, to be unhelpful. In Rachel’s example, she was lacking guidance as to how to assess the students. Her questions regarding how to score the assessments, as well as how often to administer the assessments, were left unanswered. As Rachel described her training with running records:

They went over the reasons why we were using guided reading, not necessarily how to score it. So I talked to [my fellow grade-level teachers] and they said just mark words that they get wrong or words that they skip and base it off of that. So not errors, meaning, structure, visual that kind of thing (reading off of sample paper). Just if they missed a word, check it and then count up how many [words they missed] and divide it by the number of words on the page and you'll get your percent...So no one has said you need to shoot for this percentage...They said to do it twice a semester, which I'm not even really
sure what a semester is…I don't know if they are considering a semester being a marking period or a semester being every couple of months. I don't know. So it was very confusing and overwhelming for everybody involved, even the people giving the presentation didn't have all of the answers.

Carly’s school had a full-time literacy coach and two part-time literacy coaches that were to help teachers and answer any literacy or assessment questions they had. For Carly, her running record training was described as, “The one [literacy] coach just came in quickly and said, ‘This is how to do it. Let me know if you have any questions.’” To Carly, the training was minimal and created more questions than it answered. In addition, Carly was unable to receive guidance with data-driven decision making when planning activities for her intervention group. In her words, “I've asked for help for interventions and things to do with my kids. I've yet to really get any help with that.” Despite her numerous colleagues and the support systems in place in the school, Carly's requests for help seemed to have fallen on deaf ears.

When looking for guidance to monitor her students’ progress using resources from a lower grade level, Carly had difficulty finding somebody who was willing to provide meaningful assistance. Carly began actively seeking specific help by approaching her school’s full-time literacy coach. Her initial efforts were fruitless. Finally, after additional attempts, Carly received an email from a part-time literacy coach in the school. Although the emailed directions were intended to assist Carly, it failed to provide the deep, meaningful guidance that she desperately sought. Despite Carly’s attempts to obtain aid, her literacy coaches and fellow teachers were unable to successfully address her inquires.

As she disclosed,
Actually this is the second time I have asked for help for doing the off-grade-level monitoring. They said that I had to have data to show that they got this score and this score and this score in the last three passages [and are making enough progress to use the second grade testing materials]. I’ve asked somebody to come again and show me how to do it. On Friday I asked [the school’s full-time literacy coach] about it and she was told that she can only do guided reading that the other literacy coach is supposed to [help with] DIBELS. That was the second time that I have said something about getting help for it and I have yet to… [The other literacy coach] sent me papers through email. She sent me an email with papers on how to [use testing materials from other grade levels]. And then one day in the hall she asked if I understood them. I was like, ‘No. I would like somebody to come up and sit down with me when I give the first grade [assessment].’…There are still questions that I have. Why am I [monitoring their progress] on a first grade level when they are going to be reading second grade [passages on the benchmark assessments]? Another thing is other teachers don't know about [monitoring off-grade-level]. I’ve asked a couple other second grade teachers and they’re like, ‘We were never told we had to test them off grade level so all of ours are [tested on] a second grade level.’ Another said, ‘Well I was told anybody who is [identified as needing intensive or strategic help] just automatically test them off-grade-level.’

Carly’s narrative illustrates that the teachers and staff in her school were not collaborating or providing support for each other in regards to data. Not only was each teacher following different protocol for assessing his or her students, but, in order to receive any guidance, the teachers had to actively pursue it.
It is important to note that the novices often received assistance when they directly asked for it. As they began their teaching careers, the novice recognized their need for help. Their sources of assistance ranged from colleagues, mentors, literacy coaches, and family members also in education. The novices recognized their own lack of knowledge and were willing to seek help. However, the novices recognized that in order to receive help, they must actively seek it themselves.

At the beginning of the year, Rachel recognized her own weaknesses regarding data and planned to seek help from her mentor. When asked during her initial interview if she saw herself getting help regarding data use from others, Rachel responded,

Well hopefully [my mentor teacher] will help me. I'm hoping to rely on [my mentor teacher] a lot because I don't know any of it. I don't know if there are trainings available. If there are things available in the district, I would love to go and learn about it. But other than [my mentor teacher], I don't know.

However, Rachel quickly learned that in order to receive help, she must actively seek assistance. When asked to describe her first data-analysis meeting, Rachel shared, “I asked a lot of questions because I didn't really know. I was an active participant because I was asking questions. I was making them teach me what to do (laughs). So I took an active role.” In Rachel's experience, she had to demand or "make them" provide her with the guidance that she needed in order to understand the data. Help was not freely offered.

Similarly, Carly recognized that she had to ask questions in order to receive any help. When describing her first year and her willingness to look for help, Carly explained it this way, "Last year I came to [my mentor] a lot for help, but I started talking to [one of the school's reading specialist]...Last year I asked a lot of questions." At a follow-up interview, Carly shared
that she had received help with completing her running records. When asked to further explain this training opportunity, Carly shared, “[It was] just with me. I asked her to sit down with me because I don’t think some of my kids are leveled right.” Even though she was not required to reassign her students until later in the year, she was concerned about their progress. Despite the fact that the rest of her grade-level team was new, she was the only one to receive additional training because she actively pursued it. Like Rachel and Carly, Ann received assistance only after specifically requesting it. In her short career, Ann had gone to her mother, her literacy coach, and her mentor looking for guidance. Ann's mother also taught the same grade level in the district; thus, making her a reasonable guide and confidant. Ann shared her experience with seeking help with the score reports from her mother,

Yeah, I've already asked my mom, ‘What's this stuff?’…I just asked her about the whole composite score. How do they come up with that? What does that mean? And she was like, ‘We have no idea how they come up with that score.’ It's the [same] big questions for everybody.

While her mother was a veteran teacher and an easily accessible source of help for Ann, she was unable to provide a comprehensive explanation for the data. Ann also actively sought help from the other teachers in her building. According to her,

I did get a paper from someone. I must have been asking somebody [about the acronyms]. They did give me a paper that has what everything means on it. So I've actually been using that a lot. It tells me exactly PSF stands for Phoneme Segmentation Fluency. That has been helpful.

Ann found that by asking direct questions, such as what the acronyms stood for on the data sheets, she was able to receive the direction that she needed.
When in need of guidance, Joe went to the literacy coach in his building. When asked how he got help, Joe responded, "The lit coaches, I mean I can go to [the literacy coach] a lot and she can guide me in the right direction." This point was reiterated when Joe reflected on completing his running records, "Well we did them a little bit in college and then when we did the training here. The [the literacy coach] has kind of been my go-to if I need help." In Joe's experience, when he needed help he knew that he could go to the literacy coach for assistance. While help was not offered freely, when the novices directly asked for assistance and sought it out themselves, they were often able to receive the answers to their queries.

**Data conversations in the mentoring program.**

As part of the district's induction program, the novice teachers were assigned a mentor. However, whether due to internal flaws in the organization of the program or a lack of a data-driven culture in the schools, the novices received little guidance from their mentors regarding data and data-driven decision making. While Joe shared that he did talk with his mentor, he clearly stated that they never discussed DIBELS scores or what to do with the data post-collection. Despite the close relationship he shared with his mentor, Joe was unable to identify a conversation that focused on analyzing his students’ data to make appropriate instructional decisions. Carly’s mentor transitioned to a new position immediately prior to the start of the school year and was now traveling to different buildings to teach computer. Consequently, Carly’s mentor was not always immediately available. While Carly described her relationship with her mentor as friendly, her mentor did not provide specific guidance regarding data-driven decision making. Carly shared that she has not discussed what to do with her assessment data with her mentor; when they do discuss assessment and data, the conversations focused on finding time to monitor students’ progress and interventions. When asked in a follow-up interview to
further elaborate on her data-based conversations with her mentor, Carly responded, “I've asked her before about what she did with monitoring her students’ progress. She just tells me anything that she knows. That's basically what anyone here knows.” As Carly’s example illustrates, the conversations regarding assessment did not focus on analyzing and using specific data. On the contrary, the conversations centered on the general assessment practices and schedules and did not provide any specific, useful guidance.

Rachel and her mentor taught the same grade level at the same school. In Rachel's case, the mentor meetings primarily focused on general advice and upcoming school events. When asked if she discussed the assessment data with her mentor, Rachel shared,

A little bit, but the last meeting we had we talked about open house and the meeting before that we talked about the parent conferences that we have to have. So not really, other than when she helped me at the [beginning of the year data analysis] meeting to put them in their intervention groups, no [we have not discussed data].

Of note, the only time Rachel and her mentor discussed the assessment data was during the formally scheduled data analysis meeting.

Due to the make-up of her grade level at the school she was assigned, Ann's mentor taught a different grade level. Initially, the difference in grade-level assignments and the fact that their classrooms were at complete opposite ends of the school building hindered any spontaneous or data-based conversations. At an initial interview, when asked if she discussed data with her mentor, Ann responded,

No. To be honest, [my mentor] and I have very different schedules when it comes to before school and after school. Today we had a meeting but she had a discipline issue with a child so we had five minutes. There are days where I don’t even see her. She’s
always very welcoming. She’s always like, ‘Let me know if you have any questions.’ I’m like, ‘I never see you!’... It’s kind of hard too because we’re not on the same grade level. Things are very different between kindergarten and first grade. It would be nice to have somebody who taught the same grade to go to for help.

While the relationship was warm and inviting, it served as more of a support network rather than an instructional aide. However, Ann was hoping for my frequent meetings with her mentor. As she shared, “We have to meet once every two weeks. I was really hoping that we could meet more than that because [I’m] new and trying to figure things out, but we haven’t been able to. We meet our minimal of once every two weeks.” Initially, Ann's mentor program was more of a formality than a real source of help. Even though Ann desired to meet more frequently, scheduling concerns hindered their ability to meet, resigning the program to merely a box checked off rather a genuine support system. However, as the year progressed the relationship changed. At a later, follow-up interview, Ann elaborated on the time with her mentor.

[The mentor meetings are] good! Yeah, those actually seem to be very helpful. She is very good. We do ours during our plan time. We have two days out of the cycle that we have common plan time because she [coaches at the high school]. So she is very busy, but I don’t mind doing that during our plan time. I feel that a lot of our talks help me. We don't really [talk about data], because she's kindergarten and we don't do a lot of the same assessments. It's hard to talk about that sort of thing. Other than that, it's going well. [We talk about] how things go. It's really a vent session for both of us. We get to help each other with whatever we need help with at this time. Whatever we are having a problem with. I think that's the most important thing.
As the year progressed, Ann and her mentor developed a closer relationship. Despite the fact that they were unable to discuss data, Ann perceived their conversations to be beneficial. Rather than focusing on anything specific, Ann and her mentor used the time to share concerns, worries, and to trouble-shoot issues they were facing.

Throughout the beginning months of the year, the novices perceived a lack of support as hindering their data use. As new teachers, they expected their veteran colleagues, mentors, and literacy coaches to offer assistance with the assessments, as well as, analyzing and using the resulting data. However, if they received guidance it generally focused primarily on general classroom practices and school events. Assistance with implementing data-driven decision making was noticeably missing.

**School culture’s influence on data-driven decision making.**

Despite the data preoccupation at the district and state levels, the novice teachers strongly felt that a data-driven culture had not permeated the schools. As one participant concisely explained, "I think it's lip service. I'm not going to get in trouble for saying that, am I?” Thus, despite the numerous mandated assessments and the overabundance of available data, the novice teachers did not see any purpose to using data as a guide for their daily instruction.

During the novices’ job interviews, data and assessment were addressed and reinforced their perception that the district was dedicated to data use. When asked about her interview, Rachel shared, “In my interview with [the school principal] he asked what I knew about testing and I said, ‘Well I know what the DIBELS are and what they are supposed to do, but what I do with them, I'm not really sure.’” At Carly's interview, she was also asked to describe her knowledge of the assessments. "This year they asked me which [assessments] I was familiar with giving from last year. They asked if I was trained in DIBELS.” However, the novices quickly
realized the disconnect between the administration's talk about data and the reality of data use. Ann first interviewed for a long-term substitution position. At that initial interview, Ann was told that her data would be watched and used as a determinant for her placement in a permanent position. While Ann accepted that her data would be watched, she expressed concern that, once she had received the position, she was not provided with the support that would allow her to be successful. As Ann explained,

Even in my interview, [data] was a huge part. They mentioned the word[s] data, testing, assessment a million times! [They asked] what I was going to do with it. [They said] that my data would be watched as a new teacher. That's fine! Watch my data! But tell me what to do with it! Tell me how to incorporate DIBELS data with running records data to form an accurate [picture of a student].

At Ann’s interview, the administration stressed the importance of data, yet the larger culture of the school contradicted this stated focus.

Despite the interviews' data-centered focus, once in the schools, the novices quickly discovered that assessment and data collection were something that was done rather than used. As the novices explained, data were collected, but were never used. The novices noted contradiction between the district's expectations and their colleagues' actual data practices. As Rachel explained, "No, I don't think [my colleagues] are using [data] as much as what the district may want them to or what we are told to do. But I think they probably base a lot of their instruction off of their observations as well." When asked how he and his grade-level colleagues use data, Joe responded,

We really don't. Maybe [we use data] initially at the beginning of the year to place the groups. We [collect data] all year long, but I don't feel as though we use it. I mean I'm
not really using it. Maybe I'm doing something wrong. I don't know. I'll monitor kids’ progress from September to January. We might look at it, but not until January.”

Despite all of the time spent assessing and progress monitoring the students, the data were never looked at in the schools. Similarly, Carly talked about giving the beginning of the year placement test, but then never looking at the results. While the assessment served as a snapshot of what her struggling learners knew coming into second grade, she never used the data to drive her instruction. In her opinion, the time spent giving the assessment could have been better utilized. She shared, “We gave [the beginning of the year reading placement test that goes along with the reading series] last year, but I don't remembering ever using it…It was a waste of time.”

The novices perceived their personal beliefs regarding the use of data to be on par with their colleagues. As they shared, their opinion that data were to be collected but not used was mirrored by their colleagues. When asked how her colleagues felt about data, Rachel responded,

I think they do [collect the data]. I think they probably like it the same as I do. [They use] it for intervention groups or to see what students are really struggling and what students are not struggling. [My mentor] has the special ed kids so it's nice for her to see if they are making any progress or if they're just kind of flat-lined. I would say that they are probably on the same page as I am.

Carly shared a similar sentiment. When asked if her colleagues used the assessment data, she believed that they did not use the data. She explained, “Just from talking to other people. They are doing the same exact thing I'm doing. Obviously if they are changing what they are doing based on data, we're not going to [be doing the same thing] in our classrooms.” In Carly's opinion, if teachers were using the data to determine what they did or did not teach, each classroom would be unique. Since her colleagues were all doing the exact same thing, she
determined that they were not using the data. Ann viewed assessment and data collection as something that people just did because they were required to do it. In Ann's opinion, the school leaders could not express negativity toward the assessments and data since upper administration and the state are coercing data collection and use. When asked how her colleagues felt about data, Ann responded, “I don't know. I know that the other reading specialist and I don't look at all data. I don't know anybody else's take on it because we are just told to use it. I don't think the administrators can complain about it because they know that we have to do it.” Clearly, the novices perceive the data-driven decision making process in the schools as only data collection. They perceive data as being collected, but not used for any meaningful purpose.

The teachers' bi-weekly literacy meetings were intended to be a scheduled time for data-based discussions. However, even at these meetings, data were not discussed. As Rachel shared, "So we were told to bring our data to our grade level meeting the other day and [my mentor] brought it and we did nothing with it." Ann reiterates this point, At the literacy meetings we do not look at any data, which surprised me. I took data with me. I took the scores [from when the students’ have their progress monitored] that I had been given and that were put into the computer for me. I’ve been taking notes in my intervention logs and things like that…but we don’t use any of that. It was just strictly What are you doing in interventions and do you need help.

At a follow-up interview, Ann expanded on her previous observations regarding the bi-weekly literacy meetings.

I thought that from the get-go our bi-weekly literacy meetings were supposed to be looking at the data and deciding which kiddos need to move. Well our literacy meetings have just been how's everything going, what are you doing, does anybody need moved?
Everybody says no or if somebody says yes then you have a big argument as to, ‘No, I'm not moving them.’ So we got an email last week from [our principal] saying the data must be looked at. Even though the expressed purpose of the bi-weekly literacy meetings was to discuss students' data, personal feelings and observations ruled the decision-making process at these meetings. It was not until after another email from the principal stating that data were to be used, that the teachers began to seriously prepare their data for the meeting. Despite the fact that their groups had initially been based on the data, the novices found that data were not used when reforming groups. When asked if his grade level looked at data during their bi-weekly literacy meetings, Joe responded, “As of now, no.” As these conversations clearly depict, despite the administration's push for data use, even the meetings, which were intended to be data-driven, fail to make data a priority.

The absence of assessment and data in the planning of the induction meetings was another indication that a data culture had not been established. The novices were provided with a schedule of the monthly induction meetings for the year, which included the topic and the district's administrator that would be facilitating. As the “Enhanced Induction Program Schedule” shows, scheduled topics included classroom management, discipline, communications, differentiated instruction, Response to Intervention (RTI), special education, co-teaching, and “hot topics in education.” The novice teachers perceived these meetings to be unhelpful. As Ann laughingly described the meetings, “It's stuff that if we didn't know about, how did we get hired. Last week was differentiated instruction. Like we don't differentiate!” Carly described induction meetings as,
Each person has something different that they talk about. So far we have talked about dealing with behavior and discipline. The junior high principal had it so he based everything off of kids fighting in the halls. We have some little fights here but not really... And then I missed one with [an elementary principal] on parent communication, which they said was an excellent one. Go figure… The last one was differentiated instruction. Basically everything that was said there I kind of already knew.

As these novices shared, the information shared at these meetings did not provide the teachers with the specific help they needed. Rather the meetings touched on large, general topics that were historically stressors for novice teachers.

However, education is changing. When asked if any of their induction meetings discussed the district's assessment and data practices, the novices were at a loss. They all shared that data had not been discussed yet and went in search of their schedules. When asked if they had discussed data, Ann stated, "No and I don't know [if we will]. Let me grab my folder. I don't think that that's even part." After going through all of her materials and handouts and reading the schedule carefully, Ann found no evidence that data and assessments were discussed. Likewise, Rachel answered, "I think tomorrow is special education. [We have one called] response to intervention? Would that be data? I don't know. So, no, none of them say data."

During an interview with the Director of Elementary Education, I questioned him regarding the induction meetings and the lack of data use. While he did not have a direct hand in the development and planning of the induction meeting schedule, he stated that he was not surprised that data were not included, as data conversations were not occurring regularly in the district. When asked about the Response to Intervention session, he was surprised that it was
even a topic since the schools did not follow the Response to Intervention model. In his opinion, it was only included on the schedule since it was a buzzword in education.

When asked if and when they would talk about data during the induction meetings, Joe's joking response captured the essence of the lack of data culture: "It could be, you know, at the May meeting when we'll talk about data. The year's over. I don't know. It's a possibility.” In his tongue-and-cheek comment, Joe recognized that data were not a priority in the schools, and while guidance may be provided it will only occur too late to be beneficial.

**Influence of district expectations on data use.**

A major influence in novice teachers' data use was the expectations and mandates from central administration. The district's upper-level administration determined what data were available and how data were to be used. Novice teachers' perceived these mandates as comprehensive; thus, they only selected and used data as specified by the district.

Through the interviews, it was obvious that the district had a language arts focus. While there were multiple language arts assessments and screeners mandated, there were no benchmark math assessments required. Historically, the district had required a beginning-of-the-year and an end-of-the-year mathematics assessment to gauge students' progress throughout the year. However, this year the assessment was not required. Carly had been a long-term substitute the year before and was familiar with the required math assessment. She had copied the test and given it to her students before being told that it was no longer required.

I copied all of the [beginning-of-the-year math tests] and then the Title teacher came up and said we are not required to have beginning-of-the-year assessments. So I asked the other second grade teachers and they didn't do them so I was like, ‘Then, *I'm not.*’ I think we ended up [giving the test], but I never graded them.
When asked if she would still use the results, she responded, "Probably not." Without direct guidance as to how the data were to be used, the data simply were not utilized. In addition, the novice teachers never collected their own data to describe their students' math progress. The participants, all first and second grade educators, did not have any data on math. Ann had her Teacher Effectiveness Evaluation, which was a data-driven observation process, during her scheduled mathematics time. As Ann described,

> It's funny because I did my [Teacher Effectiveness Tool] observation with [the principal] in math and part of the pre-observation questions was ‘What data you are going to use?’ Well fortunately [we were doing] word problems in math so it combined language arts. I told [the principal] that we don't have any math data because we don't do any testing in math. I can use my observations and what I know about kids in math and use their DIBELS [scores]. I pretty much grouped [the students] according to what their guided reading groups were for the [math] activities. I didn't have any data.

In the absence of math assessment data, Ann based her decisions on the reading data and observations. Carly, a professed math lover, yearned for math data. In her words, "I would like to group them [for math]. I wish we had data on math instead of just reading." Even though she believed that grouping her students for math would be beneficial, she viewed the lack of standardized assessment data as a hindrance. Joe also expressed frustration that math was often forgotten and left to be squeezed in once language arts was completed. When asked if the focus on language arts was a personal or district focus, Joe responded, "A district focus." Interestingly, despite their frustration with a lack of math data, none of the novices sought to create their own mathematics benchmark assessment or keep data on their students' progress in math. Without the district's mandates, data were neither collected nor analyzed.
The district mandates also determined which language arts data would be used and which would be merely collected. The participants continually cited that DIBELS and running records were required. As Carly shared, “Along with DIBELS and monitoring students’ progress with DIBELS, you now have to do, one running record per marking period to make sure [the students] are leveled where they are supposed to be.” Joe reiterated this point by saying, "Well now they put running records into the whole slew of everything. Now on top of DIBELS, we are doing running records to try to make sure [the students are grouped correctly].” The novices noted that DIBELS was the primarily source of data, followed closely by running records.

Interestingly, the GRADE assessment, a language arts assessment given at the same benchmark periods as DIBELS, was not included in any of the data discussions. At Carly's school, the GRADE data were not given to the teachers until after the data analysis meeting. During our interview, Joe discussed the use of GRADE data,

   Interviewer: Did you use [the GRADE data] in the [data analysis] meeting?  
   Joe: We didn't. We have it but...  
   Interviewer: So you do have it. Have you used it for anything?  
   Joe: I've looked at it. . . . but I just kind of put it by the wayside.

As both novices shared, the GRADE assessment was expected to be given, yet was not used in the data analysis process. Consequently, the novices discredited the data and did not use them as the basis for their instructional decisions.

Interestingly, the GRADE assessment and data were neither included in the forms that were to be completed during the data analysis meeting nor were they mentioned in the team process guidelines that the literacy coaches were to follow. The forms, including the “Data Analysis Grade Level Goals” and the “Classroom DIBELS Goals for Next Benchmark,” focused only on the DIBELS data. The success of the class, as well as the identification of weaknesses, was derived only from the DIBELS data. The literacy coaches were provided with a guideline
for running the literacy meetings entitled, "Data Analysis for Instructional Decision Making: Team Process," which was adapted by the Pennsylvania Department of Education. The guide identified DIBELS, 4Sight, AIMSWeb, and PVAAS as data sources that should be used in the data-driven decision making process. The GRADE data were neither included nor mentioned. In addition, the bi-weekly literacy meeting note sheet, which was to be submitted to all team members and administration following the meeting, started with listing the DIBELS percentages based upon the benchmark data. Clearly, DIBELS data were the focus of data-driven decision making. Without a formally structured plan for using the GRADE data, the data simply were not utilized. The district's lack of focus regarding the GRADE data reverberated into the novices' classrooms, where the GRADE reports became shelf filler rather than a meaningful guide for instruction.

The district's expectations and mandates for how data was to be used also defined data-driven decision making for the novices. The goal of the data analysis meetings was to group students for the thirty minute intervention period. Rachel described her first data analysis meeting as,

At the meeting, we sat there and first talked about who goes where and how you put a student [in a placement] I asked a lot of questions because I didn't really know. Then we went through and picked out all the [students identified as needing intensive support] and then all the [students identified as needing strategic support]. I put those [students] into groups) based on their [DIBELS Oral Reading Fluency] scores…That's all we pretty much did. We just grouped them by scores and then by what they were learning.
As Rachel shared, the teachers used the DIBELS composite score to place students in groups for interventions. Ann's experience was similar. Ann described the purpose of her data analysis meeting as,

Last year they decided that interventions started too late [in the year]. So they wanted to get a jump on getting interventions started earlier [this year]. We already had groups started and we were working with kids. We needed to look at [the students’ current] DIBELS scores and see where they were and get them into new groups. Some kids stayed in the same group and some kids had new groups. We also set goals. We talked about what goals we have or where we wanted kids to be at the beginning, middle, and end of the year.

Like Rachel, Ann viewed the over-all purpose of the meeting as appropriately grouping students. While they did do some goal-setting, creating groups was the ultimate goal. Similarly, when asked what the general purpose or goal of the data analysis meeting was, Carly responded that it was to place students in intervention groups. During the meeting, the teachers wrote the students' names on wipe boards, changing and moving students as necessary. Carly also cited data from the Quick Phonics Screener (QPS) as a basis for grouping students for interventions. “We use the QPS when we were putting them in groups for interventions. We looked to see how far they had gotten on the QPS and where they needed help. We had a paper that we had to fill out on the students showing [which skills they needed to practice].” Like Rachel, Carly used the data to group students. However, while Rachel cited only using the DIBELS composite, or total, score, Carly also incorporated data from the QPS when forming her groups. Joe also used DIBELS and QPS data to create groups. He described his data analysis meeting in this way, “We looked at all of our DIBELS [data] and then…we looked at our QPS [data]…We looked
mainly at the QPS data for our interventions to see [which skills they were working on].” For all four novices, the data analysis meetings meant looking at the data to form intervention groups. While some teachers were given specific direction as to what to cover, such as letter recognition or a specific phonics pattern, during this thirty-minute period, others were given a broader group, such as fluency or comprehension. Using the data to drive their everyday, whole group instruction was never discussed.

The singular goal of using data to form intervention groups was reinforced during the bi-weekly literacy meetings. When asked about his bi-weekly literacy meetings, Joe responded, "We had our [first grade] meeting today and we talked about our data a little bit and where our kids are and if we need to move them up or down in our intervention groups." Ann also shared that the bi-weekly literacy meetings focused on moving students between groups.

Well our literacy meetings have just been how's everything going? What are you doing?

Does anybody need moved? Everybody says no or if somebody says yes then you have a big argument as to no, I'm not moving them blah, blah, blah.

Similarly, Carly described her school's bi-weekly literacy meetings as a scheduled time to reevaluate students' placements within the intervention groups. In her words, "The only thing we discuss is if we think [a student needs to move] within intervention groups. And most of the time there isn't." While the bi-weekly literacy meetings provide a time for the teachers in the building to come together, the district's mandates have stifled discussions regarding additional uses of the data.

These meetings have defined data use for the novices. When questioned on the purpose of data collection and analysis, all four novices cited grouping students as the sole goal. When asked about using student assessment data at the meetings, Rachel shared, "I think the data
[were] only to show why we were going to move a student.” When asked what data use meant to her, Carly stated, "Basically just group[ing] the students according to what their needs are." When asked the same question, Ann responded, “I guess using our test scores, especially in our intervention groups…Making sure that we give the kids what they need based upon their test scores and then using that information to drive what I do in interventions with the kids.” While perhaps initially designed to promote data-based conversations, the district's procedures and recommendations for data meetings have become the sole purpose for data-driven decision making.

Chapter Conclusion

Various structures within the district discouraged novices from engaging in data-driven decision making. The novices perceived their lack of comprehensive training regarding the assessments and data, validity concerns, and the social influences in the school as impeding their data use.

The absence of a comprehensive pre-service and in-service professional development program focused on assessments and data-driven decision making hindered the novices from effectively using data. Left without knowledge of the assessments, what the score reports showed, and how the data could be used to guide instruction, the novices simply did not use the data. Additionally, the novices’ concerns regarding the validity of the assessments inhibited their data use. As a result, the novices utilized their personal observations, rather than the assessment data, when making instructional decisions. Moreover, the social structures within the schools dissuaded novices from engaging in data-driven decision making. The principals’ approach to data use, as well as lack of meaningful support from colleagues and mentors created a school culture unconducive to meaningful data use. The various structures and pressures the
novices experienced discouraged data use from being anything more than mere collection. However, it is unclear if the teachers’ ultimate decision to discredit the data stemmed from ignorance or resistance.
Chapter 5

Conclusions and Recommendations

Introduction

In recent years, data have permeated education. Faced with countless standardized tests, benchmark assessments, instructional screeners, and curriculum-based assessments, novice teachers are quickly buried under a mountain of collected data. However, despite the government and the district’s best efforts, these data are not always effectively utilized. Research has shown that novice teachers, while required to use assessment data, generally lack the training and supports necessary to engage in meaningful data-driven decision making. This study explored the dynamic nature of novice teachers’ perceptions and beliefs regarding data-driven decision making. The central research question was: How do novice, elementary teachers perceive their training in and assess the efficacy of data-driven decision making? The subsidiary questions included:

- How do novice teachers describe their pre-service and in-service training involving making data-driven decisions?
- What is the perception of novice teachers on the role of assessment, data analysis, and data-driven decisions in their instructional activities?
- How do principals and colleagues encourage or dissuade novice teachers from engaging in the data-driven decision making process?

Overall, the participants’ narratives illustrate why they have chosen to engage in, selectively use, or abstain from data-driven decision making. Their perceptions suggest a reality in which data analysis and instruction are relatively disconnected. The participants’ narratives show that 1) they perceive their training involving data-driven decision making to be lacking; 2)
they perceive a disconnect between assessment and instruction; 3) the school culture is a main determinant for data-based practices; and, 4) school-based leadership affects data-based practices.

Although the district appeared to embrace data-driven decision making, the actual day-to-day happenings in the school painted a much different picture. As one participant acknowledged, the district’s dedication to data was little more than “lip-service.” As Ajzen’s theory of planned behavior (1991) asserted, novices’ dedication to data-driven decision making was influenced by their attitudes, subjective norms in the school, and perceived behavioral control. Their beliefs that using the data would lead to unfavorable outcomes and would not ultimately improve their students’ learning, the lack of support for data-driven decision making from colleagues and school-based leadership, and factors such as limited training and time constraints, influenced novice teachers’ decisions regarding the use of data in their classrooms.

The purpose of this study was to explore novice teachers’ perceptions regarding data-driven decision making, specifically their beliefs regarding their data-based training, the effectiveness of data use, and the social factors that support or dissuade effective data-driven decision making. From this case study the following conclusions can be drawn 1) training significantly impacts novice teachers’ perceptions and decision to engage in data-driven decision making; 2) the perceived disconnect between assessment and instruction negatively affects novices’ data use; 3) the social factors and culture of the school influences the extent of novices’ decisions to engage in data-driven decision making; and, 4) school leadership influences the larger school data culture and ultimately affects novices’ decisions to engage in data-driven decision making.
Data-driven Decision Making Training

The novices’ cries for training, guidance, and answers reverberated throughout the study. As they entered the classroom as a professional for the first time, they freely expressed their own perceived limitations for meaningfully using student assessment data. Explaining what hindered her data use, Rachel shared, "Probably the knowledge about it. I don't really know a lot about it or what I'm supposed to use it for. I would say that probably holds me back quite a bit."

Rachel’s comment was reiterated by Ann. “I need to learn more about how to use the data for other things, to be honest.” Despite their yearning for understanding, the novices felt they had received very little data-based training. At least two months after commencing their position, the novices received DIBELS Next training. As the novices asserted, this full-day training focused on administering the assessment rather than analyzing the results and using data to drive classroom instruction. The novices did not receive any training on the GRADE assessment, which, consequently, condemned the data reports to the novices’ forgotten shelves and desk drawers.

This lack of training significantly influenced how the novices used the data. The novices equated their lack of knowledge of the GRADE assessment with their inability to meaningfully utilize the data. As Rachel stated, “Well, the GRADE, I don't even know what that is. I've never done anything with it. I've never used it.” Similarly, Joe said, “I've looked at it. . . . but I just kind of put it by the wayside.” When asked if she used the GRADE data, Ann bluntly stated, “No, because I don't know how to read it.” Thus, novice teachers’ knowledge of the assessment and the resulting data significantly impacted their decision not to engage in data-based practices.

This finding is consistent with the current body of research. As Ingram, Louis, and Schroeder (2004) explained, “It does not appear that teachers are data-phobic but rather that they
don’t have recent experience in working with data to improve specific classroom practices” (p. 1280). The novices in the case study had not been introduced to the student assessments or the data-driven decision making process during their pre-service years. As thoroughly noted in the literature, one of the largest hindrances to making data-based decisions appears to be a lack of the necessary training, knowledge, and skills to meaningfully analyze, interpret, and act upon data (Mandinach et al., 2006; Mokhtari et al., 2008; Schildkamp & Ehren, 2013; Vanhoof et al., 2013; Wayman et al., 2013). The novices’ lack of training in their teacher education programs coupled with their limited in-service training resulted in the novices basing their instructional decisions on their observations, personal beliefs, and the textbook rather than the student assessment data. When asked if she made changes based up her students’ assessment data, Carly explained,

… I change my groups for guided reading based on how [I feel] they are doing on running records or just reading with them one-on-one -- not necessarily [based on the data]. If I notice that a student is having trouble with something that we are doing in class or whatever I will repeat it or pull them aside and work with them one-on-one, but I wouldn't necessarily change it. Probably should.

Ann also modified her groups based upon her observations, rather than the data. “I do [grouping students] based on my classroom observations and what I know about the kids and what I know about their comprehension skills and what I know about their word attack skills.” Joe shared a similar sentiment: “So I think I would use what I see in the classroom versus what we do in DIBELS.” Without the knowledge of how to complete running records, interpret the DIBELS scores, or decipher the GRADE reports, the novices chose to disregard the assessment data when making instructional decisions.
The novices’ lack of training and inability to interpret the reports factored into this decision. When asked to describe what she would need in order to utilize the data, Rachel explained, “I would say, on the DIBELS [score report] that gives you lines and lines and lines of things they rate, knowing what that's for or even what all the abbreviations mean. What I can use [the data] for in my classroom rather than just giving me numbers.” Rachel’s response highlighted the novices’ concern. They were unable to explain the purpose of the assessment, decode the acronyms, interpret the reports, or use the data to modify their instruction. Although time was provided for teachers to analyze the data, it did not guarantee that it would be used when making instructional decisions (Cosner, 2011). As Firestone and Gonzalez (2007) stated, “The users of assessments do not always understand how to interpret the results” (p. 150). Research shows that school staffs lack the skills to ask and answer questions regarding data and the capacity to effectively use the assessment data (Kerr et al., 2006). Lacking the capacity to use the data, the novices relied upon on their observations and personal beliefs.

Without the necessary training to read, understand, and use the data, novice teachers simply did not utilize the data independently. As Heritage and Chen (2005) stated, “Our view is that educators are more likely to believe in the value of data if they have the skills to use them” (p. 710). Thus, training is imperative for increasing teachers’ use of data. Teachers and school staff require training and support when interpreting the data and using it to inform their decisions (Firestone & Gonzalez, 2007; Kerr et al., 2006; Young, 2006). While the district attempted to promote data-based practices, it failed to consider the necessary support the teachers required. As Firestone and Gonzalez (2007) offered,

The district office can easily facilitate the effective use and understanding of assessment data by providing educators with step-by-step instructions, through a formal
staff development process or through a manual that guides their analysis by communicating a common protocol for simple data analyses. This process is often a result of a set of guided questions that require teachers and administrators to examine the data in a particular way. (p. 151)

While the literacy coaches were to follow the “Data Analysis for Instructional Decision Making: Team Process” (see Appendix G), the data analysis meetings did not follow the prompts regarding instructional strategy recommendation and team capacity building. As an insider in the district, none of the countless data-analysis meetings I have attended have moved the conversations from looking at the score reports to modifying instructional practices. Rather, the data analysis meetings focused on superficial goal setting and shallow data analysis. As Ann shared, “…we were just told okay write . . . your kids’ names on this paper and then check off these boxes.” None of the novices completed a miscue analysis or compared the DIBELS results, running record data, or the GRADE reports to triangulate the data, creating a comprehensive picture of the students. Moreover, as the data analysis forms in the appendix indicate, the only data the novices were to credit were from the DIBELS assessment. Thus, without the necessary training to triangulate the data, the novices were left questioning which data source to discredit. Moreover, data analysis training needs to be on-going. As Heritage and Chen (2005) assert, “We know that our participants will need to develop more sophisticated skills, which will depend on the continuous use of data – the use-it-or-lose-it principal (p. 710). Thus, time to develop data analysis skills must be held multiple times a year, in order to support teachers as they initially collect the data, interpret the reports, make instructional changes, progress monitor, and reflect on the impact of their instructional changes.
While the teachers understood that they were to use data, their lack of training and understanding impeded their behavior. As explained by Ajzen’s theory of planned behavior (1985), while the novices understood that they were expected to use data, their lack of skills, knowledge, and training hindered their engagement in the behavior. Thus, the perceived inadequacy of both their pre-service and in-service training prevented the novice teachers from engaging in the data-driven decision making process. It seems reasonable to conclude that in-depth training is imperative for novice teachers’ data use.

Assessment Versus Instruction

The novices perceived incongruity between the assessments and their instruction. As Kerr et al. (2006) found, “Perceived validity of data greatly affected data buy-in and use” (p. 512). The teachers in this study perceived the assessment data as invalid; consequently, they relied heavily on their personal observations when making instructional decisions.

Perhaps due to their lack of knowledge regarding the assessments and data, the novice educators perceived the assessments as invalid. They perceived the assessments as testing different skills than the skills they taught in their classrooms. For example, on the DIBELS assessment, the students were scored based upon their ability to read nonsense words. Ann perceived her students’ ability to read nonsense words as an inaccurate indicator of her students’ learning in her classroom, for she was primarily concerned with their ability to read real words in context. Ann shared, “…To be honest, I don't really care if a kid can read a nonsense word…Why can't they just read real words?” Likewise, Joe perceived the oral reading sub-test on the DIBELS assessment to not be a true reflection of his students’ reading abilities. Joe perceived comprehension as more important than correct words read per minute. To him, having
his students understand what they are reading was more important than how fast they could read. Joe declared,

And the bad thing is they have only been looking at one number [that only shows] how many words per minute they read. They are not looking at the students’ ability to comprehend. Can we just get them to forty-seven words per minute by the end of the school year? What about the comprehension? The students do not comprehend what they are reading.

As these examples show, due to this perceived incongruity between the novices’ everyday instruction and the assessments, the novices chose to disregard the data.

The burgeoning literature on teachers’ data use highlights novice educators’ concerns regarding the validity of the data. Kerr et al. (2006) found that sixty percent of teachers who responded to their survey stated that the information provided by classroom assessments was more beneficial to planning. “ As Cosner (2011) stated, “In particular, teachers may not necessarily relate assessment analysis with the underlying content and skill represented in assessments when they use assessments that have not been specifically mapped to content, standards, or skills” (p. 582-3). Relevant data should be closely correlated with the reality of teaching and learning within that context (Earl & Louis, 2013). For these novices, decoding and comprehending real words in context, rather than decoding lists of nonsense words, was the reality of learning to read in their classrooms. Thus, the novices in this study perceived the skills tested on the benchmark assessments to not be closely aligned to the skills and content they were teaching in their classrooms.

As a direct result of the perceived invalidity of the data, the novices chose to rely on their observations when making instructional decisions. Faced with assessments they viewed as
invalid and data reports they could not interpret, the novices turned to their observations, or what they knew, when forming groups or determining what to teach. To the novices, using their observations was more accurate and less time consuming than utilizing the assessment data. Rachel and Ann believed their observations showed what the assessment data could not: what the student were learning in the actual classroom. As Rachel shared,

I would probably use more of observations. Only because I think that shows me what the kids actually know and what they don't know out of what we're doing rather than just reading a passage and whether they can retell it or not. So I think I would use what I see in the classroom versus what we do in DIBELS.

As the example shows, perceived disconnect between the assessment and the instruction significantly influenced the novices’ decisions to use their observations rather than the assessment data.

Additionally, the teachers perceived their intuition and intimate knowledge about the students as superior to the assessment data. The teachers worked with these students in small groups each day, which afforded them the opportunity to carefully observe these students. These daily, extended observational times were perceived as more revealing than the one-minute, isolated assessments. As Joe shared, “I feel that I know my kids pretty well now that I've been working with them in small group every day. I feel that if I had to regroup them right now I could regroup them. I wouldn't use data really.” When making appropriate instructional decisions, the novices perceived their observations as of greater efficacy than the assessment data.

The novices’ preference toward personal observations is supported by the literature. As Ingram et al. (2004) state, “Many teachers and administrators base their decisions on experience,
intuition and anecdotal information (professional judgment) rather than on information that is
collected systematically” (p. 1281). The novices viewed themselves as professionals and
expected “to serve as their own judges and to be highly involved in the decision making”
(Conley, Bacharach, & Bauer, 1989, p. 60). Teachers feel possessive of their students and
believe “that nobody [knows] their students better than they [do]” (Kauffman et al., 2002, p.
286). However, the novices perceived the use of data as an infringement on their professional
automaticity and clung doggedly to their personal beliefs and judgments.

According to Ajzen’s theory of planned behavior (1985), human intentions are determined
in part by a person’s attitude toward the behavior and their perceived evaluation of possible
outcomes. If a behavior will lead to the most positive outcomes or success, then the person will
have a favorable attitude toward the behavior. Conversely, a person will have an unfavorable
attitude toward a behavior that they believe has the most negative outcomes and leads to failure
(Ajzen, 1985). The novices’ perceived invalidity of the assessment data and the incongruity
between the assessment and their instruction caused the novices to develop a negative evaluation
of data-driven decision making. In their opinion, using the assessment data to guide their
instructional decisions will not impact their students’ achievement in the classroom and will
ultimately lead to failure.

Culture

The underlying culture significantly impacted novice teachers’ perceptions regarding
data-driven decision making. Federal and district policies are framed by the environment and
“provide a culture around its implementation” (Wayman et al., 2013, p. 142). The social
pressures and the subjective norm, or “the way we do things around here,” shaped the novices’
within grade levels or departments, within schools, within districts- creates a confluence of factors originating from multiple levels to potentially shape teachers’ data use” (p. 522). Novice teachers’ perceptions were defined by the various influences they encountered, such as those of central administration, their principals, grade-level teams, and their mentors. While on the surface it appeared that the novices experienced pressure from the district administration and the state to use data, in reality the beliefs and values exemplified by their colleagues deterred them from whole-heartedly embracing data use. As Ingram et al. (2004) explained,

Culture is a strong determinant of how teachers use data to judge their effectiveness and it influences the type of data that teachers think is needed. As deeply held values in the organization that are often submerged, culture exerts a powerful influence on the way decisions are made, the way organizations learn, and the data that teachers find meaningful and useful. (p. 1280)

From the outside, while data appeared to be a significant determinant when making decisions, the deep-rooted values and beliefs in the schools prevented data from being meaningfully utilized. Little (2012) asserts that a teacher’s practice is embedded in the routines, scripts, and roles that exist independent from the individual teacher. While the novices appeared to engage in data-driven decision making, in reality, they perceived data use as little more than data collection. This perception was based upon and reinforced by the subjective norms in the schools.

A possible causation was the district’s accountability culture rather than a dedication to organizational learning. As Firestone and Gonzalez (2007) describe, an accountability culture is top-down, reactive, and focused on increased efficiency, short term production, and the use of data to hold individuals accountable. Rather than focusing on student learning, risk taking, and
growing as an organization, an accountability culture is driven by the need to increase assessment scores. Consequently, teachers feel separated from the data and that data is of little use to them. This overwhelming focus on test scores was acknowledged by Joe. “And the bad thing is they have only been looking at one number [that only shows] how many words per minute they read and they are not looking at like [comprehension]. [Rather,] can we just get them to 47 words per minute by the end of the school year?” To Joe, the focus was on meeting external and ill-considered goals, rather than focusing on student learning. As Ralston (2013) asserts, “When teachers’ experiences with data are ‘data for the sake of data,’ then there is no real reason for teachers to enjoy or benefit or learn from data. It is simply more work with no meaningful payoff for teachers or students” (p. 80). When the purposes behind data use and how to use the data are unclear, teachers report data-based activities as having “zero impact” (Young, 2006, p. 535). In the study, although he monitored progress faithfully, Joe found his efforts to be mechanical rather than helpful. As he shared, “We do it all year long, but I don't feel as though we use it. I mean I'm not really using it. Maybe I'm doing something wrong. I don't know. I'll monitor kids’ progress from September to January. We might look at it, but not until January.”

Ann described her training on DIBELS and data analysis as, “It was just -- here's the score. They're [identified as needing intensive support] and they need to have their [progress monitored] every two weeks.” The novices’ beliefs were reinforced by the forms that were to be completed at the data-analysis meetings. As the “Data Analysis Grade Level Goals” and “Classroom DIBELS Goals for Next Benchmark” forms show, the purpose of data analysis was only to have students meet the external benchmark standards by the end of the year. As these examples show, monitoring students’ progress was for the sake of collecting data rather than for
meaningfully using that data. The underlying purposes of data use, as reinforced by the district actions and the individual schools’ responses, clearly impacted the novices’ data use.

This district initially appeared to be data-driven; they had numerous assessments in place, scheduled team-based data analysis meetings and bi-weekly literacy meetings, and had literacy coaches in place for assistance. However, a closer examination revealed an underlying culture wherein these practices were barely more than checking off a box. As Young (2006) discusses,

Under the institutionalized logic that analyzing data contributes to superior decision making, schools and districts may display outward signs that conform to such logic – for example, formulating annual plans based on disaggregated test scores. However, old practices dissociated from that logic may persist internally through loosely coupled systems, such as accountability policies that do not reference the school plans. (p. 522)

The subtle messages the district sent to its staff reinforced the novices’ perceptions that data was to be collected but not used. For example, holding the DIBELS Next training two months into the start of the school sent a powerful message. Likewise, providing no training on the GRADE assessment sent the none-too-subtle message to the novices that the assessment was of little value and could easily be ignored. The absence of a data-focused meeting in the novice teachers’ induction meetings, as evidenced by the “Enhanced Induction Program” schedule, also conveyed to them that data analysis was not an important part of their professional obligations. More importantly, the noticeable lack of discussion and training involving data analysis and instructional use reinforced the novices’ perception that data was merely something to be collected. “No doubt the cultural surround and context that translate into rationales, needs, and purposes, will determine who uses the data, how they are used, and the sorts of interactions across levels of the stakeholders” (Mandinach et al., 2006, p. 10). Research has found that the
district leaders have a significant influence on what data is used, how it is used, and for what purposes (Firestone & Gonzalez, 2007; Young, 2006). As this case study illustrates, even more potent may be the subliminal messages from the district regarding data use and these become powerful determinants and shapers of novice teachers’ data use.

In addition, the culture and the subjective norms of the individual buildings impacted novice teachers’ perceptions regarding data. “Grade-level or departmental norms – and how the broader school leadership and culture affect them – thus can influence whether teachers view using data as a legitimate improvement strategy” (Young, 2006, p. 522). As experienced by these novices, data-driven decision making was not encouraged in the schools. Joe described his colleagues’ reaction to data as, “‘Let us teach. Let us do our stuff and we will be ok, but, no, you have to do DIBELS and the Daily 5.’ Yeah, it's so frustrating.” As a new teacher, one of Joe’s first experiences with assessment data was a negative reaction from his grade-level team. His team members, including his mentor, resisted data use and argued that they would be effective if they were allowed to teach how they wanted without the interference of data-driven decision making and district mandates. As an insider in the district, I have experienced this common attitude among the staff, for new fads, programs, and mandates come each year only to be forgotten quickly. Not surprisingly, this attitude permeated Joe’s thinking. Later he expounded, “Let me teach how I want to teach and be done with it.” Notably, none of the participants meaningfully discussed data with their colleagues or mentors. When asked if he discussed data with his professed close-knit team, Joe responded, “It's nothing. We look at it to see where our kids are, but I can't say that I've talked to somebody in the building about it specifically.” Likewise, while the novices were close to their assigned mentors, their discussions focused on data collection schedules and school events, rather than data analysis. As Rachel shared,
At the last meeting [my mentor and I] had we talked about open house and the meeting before that we talked about the parent conferences that we have to have. So [we don’t really talk about data]. Other than when she helped me at the [large data analysis] meeting to put them in their intervention groups, [we haven’t discussed data].

When asked if she discussed data with her mentor, Carly stated, “Yeah, I mean I’ve asked her before about what she did with progress monitoring and stuff. She just tells me anything that she knows. And that's basically what anyone here knows.” While her mentor was able to help her find times to monitor the progress of her students, the discussions fell well short of how to use the data.

While research shows that teachers are more likely to use data when they are engaged in team-based exploration (Ingram et al., 2004), Little, Gearhart, Curry, and Kafka (2003) assert, “Putting student work on the table (does) not ensure whether or how it (will) be taken up in conversation” (p. 190). Although the school had scheduled times for the teachers to gather as a team to review data and discuss student progress, real conversations regarding data analysis never occurred. Similar to Cosner’s (2011) study, the grade–level teams “were just going through the motions,” focusing on acceptable performance levels rather than identifying specific strengths or areas in need of improvement (p.575). As the “Bi-Weekly Literacy Meeting Log” shows, the purpose of the meeting was only to move students among intervention groups; specific data use was not required in order to complete the logs. When discussing her team’s literacy meetings, Ann shared, “Well our literacy meetings have just been how's everything going? What are you doing? Does anybody need moved? Everybody says no or if somebody says yes, then you have a big argument as to no, I'm not moving them blah, blah, blah.” As Ann further elaborated, the data was never considered and personal preferences dominated the
discussion. At a follow-up interview, Joe elaborated on his grade-level meetings. “I mean if we do have a concern, we'll talk about it. But most of the time we don't. Keep it quiet and get out of there quicker.” While Joe acknowledged that it was nice to have time to talk with his team, as the year progressed, Joe began to value his personal planning time over team-based discussions. Although there were scheduled times to discuss data, without the participants’ buy-in and a dedication to data-driven decision making, the time was essentially wasted.

Thus, novice teachers’ perceptions regarding data use were greatly affected by the beliefs of their colleagues. As the examples above illustrate, without intentionally focusing on data use, the data analysis process became a “compliance activity divorced from teachers’ classroom actions” (Young, 2006, p. 544). When asked if her team used data, Rachel responded, “No, I don't think they are using it as much as what the district may want them to or what we are told to do.” As this example suggests, data was used, at least to some extent, only to comply with the district mandates. As the examples discussed previously illustrate, the grade-level meetings were held only to fulfill the district’s directives rather than to engage in meaningful data use. As Slavit, Nelson, and Deuel (2013) assert, “Unless professional dialogue is tightly focused on the collective examination of student work from an inquiry stance, opportunities for teacher growth can arise in a haphazard manner” (p.19). Likewise, Young (2006) states, “In a school culture that does not encourage the teachers least inclined or able to work with data and that does not promote specific data uses as common teaching practice, teachers’ work with data occurs inconsistently across individuals” (p. 540). Not surprisingly, as the study found, the novices were improperly using data, such as forming intervention groups based upon composite scores alone, and basing instructional decisions from their personal experiences and preferences – engaging in the very behaviors modeled and encouraged by their colleagues.
As Ajzen’s theory of planned behavior predicted, the social factors of the school affected the novices’ intentions to engage in data-driven decision making. The subliminal messages the novices received from the district coupled with the overt resistance from their colleagues, dissuaded the novices from actively pursuing use of data in their instruction. “Continuous data use will happen only in those schools where the principal and teachers believe in data analysis as a means to school improvement…” (Heritage & Chen, 2005, p. 710). Despite the pressure from the state and the new teacher evaluation tool, the culture of the school held great sway over the way data was utilized. As Ingram et al. (2004) state, “We believe failed attempts to make these changes have focused too much on changing practices and behavior without also changing the underlying values and assumptions held by teachers” (p. 1281). As this study illustrates, the school culture can neither be ignored nor discredited when explaining novices’ data use.

**Principal Leadership**

Principal leadership is crucial for meaningful data use. As Kerr et al. (2006) state, “Empirical studies of data-based decision making have consistently found that strong school leadership is a necessary factor for successful implementation” (p. 408). The principal leadership in this study’s schools influenced the teachers’ beliefs regarding data and how the data was used. While all of the principals initially appeared to be deeply involved in data-driven decision making, a closer analysis revealed that their actions stemmed from compliance concerns rather than a true dedication to data use. They were merely fulfilling a requirement, checking off a box, rather than fostering a culture of data-driven decision making in their schools.

While the principals did attend the beginning of the year data-analysis meetings, they were not actively engaged in the data-driven decision making process. For example, Carly’s principal was in and out of the meeting and Joe’s principal only attended half of the meeting.
While pressing issues certainly vie for principals’ time, their sporadic attendance subtly let the teachers know that data use and student achievement were not of chief concern. When asked to describe her principal’s participation at the data analysis meeting, Ann shared,

He was there the whole time. Am I allowed to say nothing? Is that bad? He was just there and observed. He didn’t really step in to help. He did take notes. He did take notes about our goals because he had to present it to the [school] board that week or that night.

While Ann’s principal did attend the meeting, he did not actively participate. His interest and note taking was motivated by his obligation to report his school’s progress to the school board rather than a true dedication to data-driven decision making. For all three principals, it appeared as though their attendance was a mandatory requirement that needed to be completed.

Additionally, the principals assumed the role of manager and police rather than instructional leader when attending data-based meetings. The principals’ intentions appeared to be aimed at collecting data, complying with district mandates, and guaranteeing the meeting ran smoothly. The novices described their principals as “facilitators” or “referees,” terms that signify a managerial role. In Joe’s case, the principal’s role at the meetings was to make sure that the teachers’ were following the district’s instructional mandates and recommendations regarding small group reading. When discussing his team’s bi-weekly meetings, Joe shared, “[The principal’s] more of the facilitator. He gets it going…” When asked to describe her principal’s role in the bi-weekly literacy meetings, Carly stated,

[He comes] unless he has something in the office or something [else] and he can’t [attend the meeting]. He's usually there for at least the beginning part to get us broken up into our groups. He usually reminds us what form [number] we are on for progress
monitoring… [He checks to see who is monitoring their students’ progress] because he will occasionally say, ‘Well, I can see this person skipped a week of progress monitoring.’

Carly perceived her principal’s role as that of policeman, enforcing the district mandates.

Interestingly, the novices perceived their principals as mere messengers of the data-based requirements. All of the participants believed that the upper administration was mandating the principals and teachers to use data. As Ann stated,

[My principal's] the one that tells us to use [the data]. That's where I get confused. Some days, I feel like he's taught before he knows, but it's coming from up above him so he has to push it on us. I don't think that he is so data-driven. I don't think he is looking at the numbers exactly and saying, ‘Well she's not doing her job because her numbers aren't showing [student progress].’

All of the participants stated that the data use requirements had a “top down” origin.

Interestingly, this perception reduced the principals’ role from that of school leader to mere messenger and pawn. While still respecting their immediate supervisors, the novices did not view them as decision makers and instructional leaders.

The research illustrates that the principal is a key determinant for teachers’ effective data use. Principals’ communication is critical for shaping teachers’ data use (Cosner, 2011; Wayman et al., 2013; Young, 2006). “Leadership focused on data use – or agenda setting – affects teachers’ impetus for using data and correspondingly loosens or tightens the connections between data-driven rhetoric and teachers’ data practices” (Young, 2006, p. 532). Thus, it is the principal that communicates how reform will look in the individual schools (Cosner, 2011).

"The principal's mind-set will either promote or impede her ability to use data to improve her
school. Without the appropriate mindset, the time and effort invested in the data will be useless” (Fox, 2013, p. 13). The principals in this study, through their actions, communicated that data use was not part of the school culture, but rather another mandate that must be addressed. As Young’s (2006) study found, it is the principal that mediates and drives the change and is ultimately responsible for norm-building. While the individual principals did vary in how they organized their school’s bi-weekly literacy meetings – one facilitated, one opened the meeting when able, and another neither scheduled nor attended – their behaviors and discussions reduced data-driven decision making to just another item on the daily to-do list. As in the Cascade school in Cosner’s (2011) study, the principals’ attempt to shield teachers from data, only fulfilling obligations for data use, dissuaded the teachers from engaging in team-based, data-driven decision making as envisioned by the district’s administration. The novices in this study perceived their principals as by-standers and messengers rather than actively involved in analyzing and determining how the data would be used. The principals’ subtle actions reinforced the perception that data use was obligatory rather than useful.

The research clearly shows that training in data-driven decision making is not only imperative for teachers, but also for principals. Principals’ struggles with data-driven decision making arise from their lack of training and knowledge to use data effectively (Fox, 2013; Militello et al., 2013; Reeves & Burt, 2006; Shen et al., 2010). Cosner (2011) calls for greater attention to be “given to the learning needs of school leaders who will be expected to cultivate collaborative data practices in their schools” (p. 584). Not only must principals know and model how to use data, but they must use their position to establish a data-focused culture, provide needed resources and routines, and supportively guide teachers as they formatively use data to guide their instruction (Skalski & Romero, 2011; Wayman et al., 2013). The principals are
responsible for moving the data conversations from shallow interpretation, to identifying specific
issues revealed by the data and determining the instructional implications, in essence, answering
the “so what” questions (Young, 2006, p. 540). The principals must move from mere attendees at
the meetings, to data leaders to establish data use expectations for teachers and more importantly,
to model data use (Young, 2006).

As Ajzen’s theory of planned behavior (1985) explains, subjective norms influence one’s
intentions to engage in a behavior. Generally speaking, a person will feel social pressure to
engage in a behavior if he believes that significant and motivating people in his life would like
him to engage in the behavior. In this study, the principals’ laissez faire attitude toward data use
did not encourage the novices to engage in data driven decision making. Rather the subtle
messages sent by principals reinforced the novices’ perception that assessment data was not
important for school improvement. Thus, it can be concluded that principals play a defining role
in how data will be used in the school.

Implications

The findings of this study underscore a need for comprehensive, continual professional
development regarding data use. The novices’ lack of training hindered them from interpreting
the data reports, utilizing the data, and engaging in data-driven decision making with their
colleagues. Moreover, the principals’ lack of training prevented these school leaders from
actively engaging in the data-driven decision making process and establishing a data culture in
the schools. Comprehensive data analysis training for the teachers, leaders of the data analysis
meetings, and school administration would likely improve data analysis and conversations.

As the participants of this study and the current body of research illustrate, teacher
preparation programs have done a less than adequate job of preparing aspiring educators for the
realities of the classroom (Bain & Moje, 2012; Kinsler, 2008; Popham, 1999; Tait, 2008). Coupled with the lack of comprehensive in-service training, novices are rendered ill-prepared to effectively use data. In order to fully prepare novices for the demands of the profession, higher education institutes and school districts must provide in-depth training regarding data use. This training should not only touch upon standardized and benchmark assessments, but also on how to meaningfully use data from screeners and curriculum-based assessments. By understanding the purposes of the assessments, the underlying content covered by the assessments, and how to interpret the results some of the novices validity concerns regarding the assessment data could be addressed. Importantly, this training should be continuous, providing opportunities for novices and their colleagues to delve deeper into the assessments and analysis as their careers progress. A research study focused on teachers’ data-driven decision making training and its impact on student achievement is needed to guide future policy.

Likewise, data-based professional development opportunities must be presented to principals and other school leaders. Beginning in their preparation programs, these leaders should be provided with training regarding data-driven decision making, including analyzing the data, leading data-based conversations, team-building, and fostering a data culture in the schools. Principals’ in-service training should focus on deepening their understanding of the assessments administered by the district, interpreting the score reports, and encouraging data-based conversations in their schools. Strong principal leadership seems imperative for a data-driven culture.

As this study shows, novice teachers’ perceptions of data use have dissuaded them from engaging in data-driven decision making. In order to further understand this problem and to generate appropriate policies, additional research is needed. A multi-district study would
identify how commonalities and differences between districts and schools with varying approaches to data use impact novice teachers’ perceptions of data-driven decision making. Furthermore, a longitudinal study is needed to explore how novice teachers’ beliefs and perceptions regarding data-driven decision making change throughout their careers.

While assessment data has been deemed the quick-fix to the educational woes plaguing the nation, current data practice in the schools has focused primarily on data collection, or in some cases, data hoarding. However, in order to see true change, districts and schools must move beyond mere data collection to meaningful data analysis, from approaching data use from an accountability viewpoint to one of organizational learning, from forcing data activities on teachers through mandates to shifting teachers’ attitudes in regards to data use. As Downey and Kelly (2013) state,

…key challenges remain if these data are to be used to their full effect especially in terms of the frequency of training and professional development in data use, and in establishing appropriate structures and culture within schools to foster a democratic approach to data that strikes a balance in favour of data-informed improvement in the context of what many view as an inevitable data-driven accountability culture. (p. 87).
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Appendix A

Informed Consent Form for Social Science Research
The Pennsylvania State University

Title of Project: *Exploring Novice Teachers’ Perceptions of Data-driven Decision Making*

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1. **Purpose of the Study:**  
   This study explores the dynamic nature of novice teachers’ perceptions and beliefs regarding data-driven decision making. The central research question is: How do novice, elementary teachers perceive their training in and assess the efficacy of data-driven decision making? The subsidiary questions include:
   - How do novice teachers describe their pre-service and in-service training involving making data-driven decisions?
   - What is the perception of novice teachers on the role of assessment, data analysis, and data-driven decisions in their instructional activities?
   - How do principals and colleagues encourage or dissuade novice teachers from engaging in the data-driven decision making process?

2. **Procedures to be followed:**  
   You will be asked to participate in monthly interviews focusing on your beliefs and use of data in the classroom. These interviews will be audio recorded for transcription purposes. You will also be asked to share any documents related to your data use.

3. **Statement of Confidentiality:**  
   Your participation in this research is confidential. The data will be stored and secured at 22 King Drive, Lewistown, PA, 17044 in a password protected file. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.
Pseudonyms will be used for all participants and each school will be identified by a code number. Jill Hartsock will be the only researcher with access to the participants' identity and access to the data.

4. **Right to Ask Questions:**
   Please contact Jill Hartsock at (717) 348-2748 with questions or concerns about this study.

5. **Payment for participation:**
   Participants will receive a $25 Sheetz gift card as compensation for their participation in the study.

6. **Voluntary Participation:**
   Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer any questions you do not want to answer.

You must be 18 years of age or older to consent to take part in this research study. If you agree to take part in this research study and the information outlined above, please sign your name and indicate the date below.

You will be given a copy of this form for your records.

_________________________________________________________________________  ________________
Participant Signature                Date

_________________________________________________________________________  ________________
Person Obtaining Consent              Date
## Classroom DIBELS Goals for Next Benchmark

### Current DIBELS Scores

<table>
<thead>
<tr>
<th></th>
<th>Number of Students</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensive Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### Moving Students Calculator

<table>
<thead>
<tr>
<th>Number of Core Support Students</th>
<th>Number of Students to Move Up to Core</th>
<th>Core Support Goal for Next Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Strategic Support Students</th>
<th>Number of Students to Move Up to Core</th>
<th>Number of Students to Move Up From Intensive</th>
<th>Strategic Support Goal for Next Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Intensive Support Students</th>
<th>Number of Students to Move Up</th>
<th>Intensive Support Goal for Next Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td></td>
<td>=</td>
</tr>
</tbody>
</table>

### DIBELS Goals For Next Benchmark

<table>
<thead>
<tr>
<th></th>
<th>Number of Students</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensive Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Appendix C

Data Analysis Grade Level Goals

Date ____________

School ___________________ Grade Level _________

Current DIBELS Scores
Core Support______%
Strategic Support_______%
Intensive Support_______%

Next Benchmark DIBELS Goals
Core Support______%
Strategic Support_______%
Intensive Support_______%

Our Language Arts grade level goal is:

We chose this goal because:

Data and informal diagnostics to support this goal include:
## Appendix D

### Data Analysis and Plan for Skill Inventories

<table>
<thead>
<tr>
<th>Teacher: ____________________</th>
<th>Grade: _______</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Names</td>
<td>Move Up (MUS /MUC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skills Needed</th>
<th>FSF, PSF</th>
<th>LNF</th>
<th>NWF</th>
<th>DORF</th>
<th>DORF</th>
<th>Retell &amp;/or Daze</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoneme Awareness</td>
<td>Letter Rec</td>
<td>Beginner Phonics</td>
<td>Advanced Phonics (Accuracy)</td>
<td>Fluency</td>
<td>Comp</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skill Inventories</th>
<th>Phonological Screener</th>
<th>Quick Phonics Screener task 1A</th>
<th>Quick Phonics Screener tasks 1 &amp; 2</th>
<th>Quick Phonics Screener</th>
</tr>
</thead>
</table>

Whole Class Needs ____________________________________________

165
Appendix E

Bi-Weekly Literacy Meeting Log 2013-2014

Date:
Attendees:

<table>
<thead>
<tr>
<th>DIBELS Data Percentages</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>September/BOY</td>
<td>January</td>
<td>May/EOY</td>
<td></td>
</tr>
<tr>
<td>Benchmark:</td>
<td>Benchmark:</td>
<td>Benchmark:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic:</td>
<td>Strategic:</td>
<td>Strategic:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensive:</td>
<td>Intensive:</td>
<td>Intensive:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See notes below:

| Group 1:                  | Focus Skill(s) For Past Week- | Students Moving- | Resources needed- |
|                          | Students Moving-              | Resources needed- |
|                          | Students Moving-              | Resources needed- |
| Group 2:                  | Focus Skill(s) For Past Week-
|                          | Students Moving-              |
|                          | Resources needed-             |
| Group 3:                  | Focus Skill(s) For Past Week-
|                          | Students Moving-              |
|                          | Resources needed-             |
| Group 4:                  | Focus Skill(s) for Past Week-
|                          | Students Moving-              |
|                          | Resources needed-             |
| Group 5:                  | Focus Skill(s) For Past Week-
|                          | Students Moving-              |
|                          | Resources needed-             |
| Group 6: Focus Skill(s) For Past Week-
|                          | Students Moving-              |
|                          | Resources needed-             |

Additional Comments and/or concerns discussed:
<table>
<thead>
<tr>
<th>TITLES</th>
<th>DATE</th>
<th>TIME</th>
<th>SITE</th>
<th>FACILITATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services, Intro to Induction Program, and Peer to Peer Session</td>
<td>8/16/13</td>
<td>8:30 A.M.-12:00 NOON</td>
<td>Room C-207</td>
<td></td>
</tr>
<tr>
<td>Classroom Management: Discipline, Procedures, and Routines</td>
<td>9/19/13</td>
<td>3:45 P.M.-5:45 P.M.</td>
<td>Library</td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>10/3/13</td>
<td>3:45 P.M.-5:15 P.M.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Differentiated Instruction</td>
<td>11/6/13</td>
<td>3:45 P.M.-5:45 P.M.</td>
<td>Room B204</td>
<td></td>
</tr>
<tr>
<td>Special Education</td>
<td>12/5/13</td>
<td>3:45 P.M.-5:15 P.M.</td>
<td>Admin Bldg.</td>
<td></td>
</tr>
<tr>
<td>Co-Teaching and Culture</td>
<td>1/7/14</td>
<td>3:45 P.M.-5:15 P.M.</td>
<td>Library</td>
<td></td>
</tr>
<tr>
<td>Hot Topics for the Professional Educator</td>
<td>2/19/14</td>
<td>3:45 P.M.-5:45 P.M.</td>
<td>Library</td>
<td></td>
</tr>
</tbody>
</table>
**Appendix G**

**Data Analysis for Instructional Decision Making: Team Process**

**Part I. Initial/Fall Goal Setting and Instructional Planning Session**

**Before the data team meeting:**
- Data sets/packets are prepared for meeting in teacher-friendly format with and without student names (e.g., 4Sight Proficiency graph, DIBELS histogram, PVAAS).
- Data are provided to the team (teachers and other school personnel) in advance.
- Session facilitator (permanent) is identified by the principal/designee, and is trained in team facilitation.
- Meeting logistics, including the date/time, place, and an agenda, are arranged by principal or designee.

<table>
<thead>
<tr>
<th>Tier 1</th>
<th>Procedure</th>
<th>Typical Prompts</th>
<th>Record Keeping</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During the meeting:</strong></td>
<td>Team uses district-provided data sets.</td>
<td>Team is provided with data to be analyzed.</td>
<td>Data sets in question (e.g., DIBELS histogram, 4Sight Proficiency graph, PVAAS grade level report). Use formats without student names.</td>
</tr>
<tr>
<td></td>
<td>Team identifies current performance of grade-level cadre (particular to school) on relevant benchmark for grade and time of year. Note if grade level and individual students made substantial growth (at least a year)</td>
<td>Facilitator: “Let’s analyze how our students are doing on (benchmark skill).”</td>
<td>Summarize salient data on the Screening and Intervention Record Form (SIRF).</td>
</tr>
<tr>
<td></td>
<td>• DIBELS or other ORF measure (% at benchmark [low risk], % strategic [some risk], % intensive [high risk]) 4Sight, % Advanced + Proficient, % Basic, % Below Basic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Team sets a measurable goal or goals to achieve by the next review point.</td>
<td>“What goal(s) shall we aim for by our next review point?”</td>
<td>Record measurable goal(s) in correct format on SIRF.</td>
</tr>
<tr>
<td></td>
<td>• Goal should be stated in terms of % of students making x (give a number) progress toward identified benchmark.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Example: “By -----, -----% of students will attain the benchmark of ----- or above.”</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• For 4Sight, % of students scoring Advanced or Proficient</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• 4Sight example: “By ----, ----% of students will achieve scores of
  Proficient or above.”

Teams may generate goal for both ORF and 4Sight Proficiency.

For 4Sight, team needs to then review either Item Analysis to identify specific skills that large numbers of students missed OR Subscale Averages, which provide very broad information about

| Team selects instructional strategies that directly address the | “Let’s list some effective strategies that will assist our students to meet our goal(s).” | Use newsprint to record ideas. |
| benchmark and may select strategy to address ORF and target areas from 4Sight. | | |

| Team analyzes suggested instructional strategies according to the following filters: | “Let’s rate these ideas. |
| • Strategy should be evidence based. | • Which ones have a good research base? |
| • Strategy should be practical. | • Of those, which ones are most practical? |
| • Curricular materials should be available to implement strategy or can be readily created. | • What materials do we have available? |
| • What materials do we need?” | • What materials do we need?” |

| Team selects strategies and agrees to implement them during coming intervention period. | “Based on what we see on the display, what’s our choice for the best strategy(ies)?” | Write an explicit description of the strategy on the SIRF. |

| Team plans logistics of implementing strategy: | “As a team, how can we make this really happen for our students?” | Annotate the SIRF with “to-do’s.” |
| • Team assists all teachers in learning strategy (if not already used) using: | “What do we have to do to make sure we all use this strategy as planned?” | |
| o peer modeling and coaching | “Who can help us with | |
| o grade-level “chats” regarding implementation | | |
| o assistance by content specialists, school psychologist, etc.) | | |

• Team plans for self-monitoring of use of strategy.
• Time to create/adapt materials
• Strategies for teaching strategies to novice teachers (e.g., peer coaching, modeling)

implementation and how will we know that we are on track?”

**Tier 2**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Typical Prompts</th>
<th>Record Keeping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team identifies which students will be considered for Tier 2 interventions.</td>
<td>“Which students do we really have to watch this quarter?”</td>
<td>Data sets in question (e.g., DIBELS, 4Sight). Use formats with student names and data from ongoing performance monitoring.</td>
</tr>
<tr>
<td>• Review all available data on these students (e.g., DIBELS/AIMSweb and 4Sight Proficiency lists, or data spreadsheet containing all assessment data.</td>
<td>“How far behind are these students?”</td>
<td>Record names on SIRF.</td>
</tr>
<tr>
<td>• Identify students who are in each section (upper and lower ends) of the “emerging” or “strategic” area of the distribution on the most recent benchmark tests.</td>
<td>“What has been their slope since the last assessment?”</td>
<td></td>
</tr>
<tr>
<td>• Check for corroboration across different subtest or assessment measures (e.g., ORF and 4Sight scores).</td>
<td>“How do the DIBELS/AIMSweb scores compare with their 4Sight scores?” (for intermediate grades and above)</td>
<td></td>
</tr>
<tr>
<td>• Decide which students need Tier 2 interventions.</td>
<td>“Which students do we think will get to benchmark without extra supports?”</td>
<td></td>
</tr>
<tr>
<td>Team sets a measurable goal to achieve by the next review point for the each student identified for Tier 2 supports.</td>
<td>“Which goal(s) shall we aim for by our next review point for this student?”</td>
<td>Annotate measurable goal(s) in correct format on SIRF.</td>
</tr>
<tr>
<td>Goal for each student should be stated in terms of the desired score to be attained by the next benchmark assessment (typically the next benchmark score), or improvement on specific skill related to 4Sight data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team selects the standard protocol strategy that they feel best matches to the student’s identified area of need in Tier 2.</td>
<td>“Let’s discuss which standard protocol strategy matches this”</td>
<td>Record strategy on SIRF.</td>
</tr>
</tbody>
</table>

_Data Analysis Team Script._ Revised February, 2008. Pennsylvania Department of Education. Adapted from Kovaleski, J. F., &
Team plans logistics of implementing strategy:
- Team identifies the instructional group in which the intervention will occur.
- Team identifies frequency and duration (amount of time each day) of the intervention.
- Team plans for self-monitoring of use of strategy.

“What standard protocol intervention group shall we use for this student?”
“When and how often will the intervention be delivered?”
“What do we need to do as a team to make this really happen for our students?”
“What do we have to do to make sure we all use this strategy as planned?”
“How will we know that we are on track?”

Annotate the SIRF with “to-do’s.”
Use standard protocol checklist to determine fidelity of intervention.

Team plans for progress monitoring (at least twice per month).
Progress monitoring for skills such as comprehension or vocabulary will need team consideration and may be based on the Standard Protocol Intervention selected.

“How will we measure their progress?”
“Who will conduct this assessment?”

Annotate SIRF with progress-monitoring plan.

**Tier 3**

Team identifies which students will to be considered for Tier 3 interventions
- Review all available data on these students (e.g., DIBELS/AIMSweb and 4Sight) using lists or spreadsheet.
- Identify students who are in the “deficient” or “at risk” area of the distribution on the most recent benchmark tests.
- Check for corroboration across different subtest or assessment measures (e.g., ORF and 4Sight scores).
- Review all available progress-monitoring data for each student’s rate of improvement (slope).

“What which students are the most deficient on our lists?”
“How far behind are these students?”
“What has been their slope since the last assessment?”
“How do the DIBELS/AIMSweb scores compare with their 4Sight scores?” (for intermediate grades and above)
“Which students will need Tier 3 Data sets in question (e.g., DIBELS, 4Sight). Use formats with student names and data from ongoing performance monitoring.
Record names on SIRF.

*Data Analysis Team Script. Revised February, 2008. Pennsylvania Department of Education. Adapted from Kovaleski, J. F., &*
- Decide which students need Tier 3 interventions.

Team sets a measurable goal or goals to achieve by the next review point for the students identified for Tier 3 supports. Goal for each student should be stated in terms of the desired score to be attained by the next benchmark assessment as well as the expected rate of improvement (slope), or improvement on specific skill related to 4Sight or other assessment data.

“What goal(s) shall we aim for by our next review point for this student?”

Annotate measurable goal(s) in correct format on SIRF.

Team selects the standard protocol strategy that they feel best matches to the student’s identified area of need in Tier 3.

“Let’s discuss which standard protocol strategy matches this student’s needs best.”

Record strategy on SIRF.

Team plans logistics of implementing area of need in Tier 3.
- Team identifies the instructional group in which the intervention will occur.
- Team identifies frequency and duration (amount of time each day) of the intervention.
- Team plans for self-monitoring of use of strategy.

“What standard protocol intervention group shall we use for this student?”

“When and how often will the intervention be delivered?”

“What do we need to do as a team to make this really happen for our students?”

“What do we have to do to make sure we all use this strategy as planned?”

“How will we know that we are on track?”

Annotate the SIRF with “to-do’s.”

Use standard protocol checklist to determine fidelity of intervention.

Team plans for progress monitoring (at least once per week). Progress monitoring for skills such as comprehension or vocabulary will need team consideration and may be based on the Standard Protocol Intervention selected.

“How will we measure their progress?”

“Who will conduct this assessment?”

Annotate SIRF with progress-monitoring plan.

Team sets next meeting date.

“When shall we meet again to review our progress?”

Annotate next date on SIRF.

_Data Analysis Team Script_. Revised February, 2008. Pennsylvania Department of Education. Adapted from Kovaleski, J. F., &
**Interim Steps (between meetings):**

- Monitor fidelity of intervention.
- Monitor student’s progress (CBM).
- Change (fine-tune) strategy (may or may not require team meeting—teachers are encouraged to continue to adjust instructional
  “practice” based on classroom performance and observation)
VITA

Jill N. Hartsock
22 King Drive, Lewistown, Pennsylvania 17044

EDUCATION

Degrees


Certifications

School Administration (K-12), PA Administrative I Certificate, 2013

Reading Specialist Certification, Penn State University, University Park, 2009.

Pennsylvania Instructional II: Elementary Education (K-6), 2010.

EMPLOYMENT


AWARDS AND HONORS

Penn State's Outstanding Student Teacher, Pennsylvania State University, University Park, Spring 2007.


Evan Pugh Senior Award, Pennsylvania State University, 2007.

Evan Pugh Junior Award, Pennsylvania State University, 2006.

Presidential Freshman Award, Pennsylvania State University, 2005.

CONFERENCE PRESENTATIONS